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Five-Year Review Report

First Five-Year Review Report for BP Amoco Chemical Landfill Site Joliet Will County, Illinois

September 2005

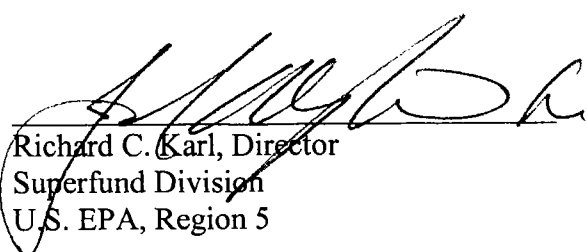
PREPARED BY:

**Illinois Environmental Protection Agency
Springfield, Illinois**

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Date:

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9/29/05

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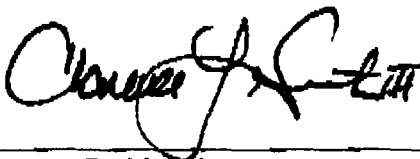
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Table of Contents

List of Acronyms	iv
Executive Summary.....	v
Five-Year Review Summary Form.....	vi
I. Introduction	1
II. Site Chronology.....	2
III. Background	2
III.A. Physical Characteristics.....	2
III.B. Land and Resources Use.....	3
III.C. Initial Response.....	4
III.D. Basis for Taking Action.....	5
IV. Remedial Actions	6
IV.A. Remedy Selection, Design, and Implementation.....	6
IV.B. Description of the Current Remedy.....	7
IV.C. General Operation and Maintenance (O & M) Requirements.....	8
V. Progress Since the Last Review.....	10
VI. Five Year Review Process.....	10
VI.A. Administrative Components.....	10
VI.B. Community Notification and Involvement.....	11
VI.C. Document Review.....	11
VI.D. Data Review.....	11
VI.E. Site Inspection.....	13
VI.F. Interviews.....	13
VII. Technical Assessment.....	14
VII.A. Question A: Is the Remedy Functioning as Intended by the Decision Documents?.....	14
VII.B. Question B: Are Exposure Assumptions, Toxicity Data, Cleanup Levels and Remedial Action Objectives (RAOs) Used at the Time of Remedy Selection Still Valid?...15	
VII.C. Question C: Has Any Other Information Come to Light that Could Call Into Question the Protectiveness of the Remedy?.....	16
VIII. Issues.....	17
IX. Recommendations and Follow-Up Actions.....	20
X. Protectiveness Statement.....	23
XI. Next Review.....	23

Tables

Table 1 - Chronology of Site Events

Table 2 - Recommendations and Follow-up Actions

Attachments

Attachment 1 - Figure 1, Site Map

Attachment 2 - List of Documents Reviewed

Attachment 3 - Public Notice Advertisement

Attachment 4 - Photos Documenting Site Conditions

Appendices

Appendix A - Water Level Hydrographs

Appendix B - Chemical Concentrations Over Time

Appendix C - Comments received from Support Agencies and/or the Community

List of Acronyms

AOC	Administrative Order on Consent
ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CQAP	Construction Quality Assurance Plan
HDPE	High Density Polyethylene
IEPA	Illinois Environmental Protection Agency
IPCB	Illinois Pollution Control Board
Facility	Existing manufacturing facility (formerly BP Amoco Chemicals plant)
FML	Flexible Membrane Layer
GWOU	Groundwater Operable Unit
HSU	Hydrostratigraphic Units
LFOU	Landfill Operable Unit
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
GCL	Geosynthetic Clay Layer
PRP	Potentially Responsible Party
QA	Quality Assurance
PRG	Preliminary Remediation Goal, proposed in the Record of Decision
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
Site	BP Amoco Chemicals Landfill site in Joliet, Illinois
SVOC	Semi-Volatile Organic Compound
TBC	To-Be-Considered
gpm	Gallons per minute
mg/L	milligrams per liter (parts per million)
µg/ml	micrograms per milliliter (parts per million)
U.S. EPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compound

Executive Summary

Two operable units have been identified for the BP Amoco Chemical Landfill site in Joliet, Illinois (herein after referred to as the "Site"). The Landfill Operable Unit (LFOU) remedy includes: construction of a landfill cap on the North and South Landfills that conforms to the requirements of RCRA, installation of a gas venting system, installation of new leachate collection systems at the down-gradient side of the South Landfill and at two locations of historical leachate seepage on the southern end of the North Landfill, installation of surface water control measures to minimize erosion and infiltration, interim groundwater monitoring of the monitoring well network at the Site to assess LFOU remedy effectiveness, physical access restrictions, and institutional controls to limit land use. Construction of the LFOU was started on May 24, 2000. As of January 23, 2001, the landfill cap was substantially completed. The other operable unit is for contaminated groundwater at the Site. The Groundwater Operable Unit (GWOU) will be evaluated under a separate feasibility study, proposed plan, and Record of Decision, yet to be issued. The triggering action date for this first five-year review is the LFOU remedial action start of May 24, 2000.

The constructed remedy at the Landfill Operable Unit is expected to be protective of human health and the environment upon attainment of groundwater cleanup goals. In the interim, exposure pathways that could result in unacceptable risks are being controlled through institutional controls (believed to be implemented), site access restrictions, and maintenance of the landfill cap. The institutional controls at the LFOU will be further evaluated for their current effectiveness, and their ability to protect against exposure to contaminants over time.

A site-wide protectiveness determination will be made: after necessary steps are taken to characterize the nature and extent of recent leachate seepage, after remedial alternatives are implemented to curtail seepage and address any resultant contaminated soil, and after the GWOU remedy has been implemented. Based on groundwater flow direction, wells near the Site are not expected to be affected by the Site.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): BP Amoco Chemical Landfill		
EPA ID (from WasteLAN): ILD 002 994 259		
Region: 5	State: IL	City/County: Joliet, Will County
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete		
Multiple OUs?* <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Construction completion date:
Has site been put into reuse? YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
Lead agency: EPA <input checked="" type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
Author name: Sandra Bron		
Author title: Environmental Protection Engineer		Author affiliation: Illinois EPA
Review period: March 7, 2005 to September 2005		
Date(s) of site inspection: March 17, 2005		
Type of review: <input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion		
Review number: <input checked="" type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action: <input checked="" type="checkbox"/> Actual RA Onsite Construction <input type="checkbox"/> Actual RA Start <input type="checkbox"/> Construction Completion <input type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify)		
Triggering action date (from WasteLAN): May 24, 2000		
Due date (five years after triggering action date): May 24, 2005		

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

Site and Institutional Controls documents and records not available on-site.
Access roads rutted and in need of repair.
Grass cover was not mowed.
Deer tracks and a few areas of sparse vegetation noted on the cover.
Settlement monument survey data not collected.
Surcharge conditions present in the leachate seepage collection system.
Areas of leachate seepage noted downgradient of the landfills.
Small area of erosion at one of the perimeter ditches.
Locks missing from some of the piezometers.
Interim groundwater monitoring inconclusive.
Impacts to Des Plaines River sediments unknown.

Recommendations and Follow-up Actions:

Collect and maintain records on-site.
Repair ruts in the access road, if not already done.
Mow the landfill cap at a minimum on an annual basis.
Continue observations of deer tracks, sparse vegetation; take corrective action as necessary.
Collect settlement monument survey data.
Address changes BP Amoco made to the leachate seepage collection system, if necessary, and implement an approved contingency plan to prevent surcharge conditions from occurring in the future.
Take necessary steps to characterize the nature and extent of seepage and remedial alternatives that will curtail the seepage.
Monitor area of erosion on the East Ditch; take corrective actions as necessary.
Provide locks on all piezometers.
Continue groundwater monitoring until sufficient data has been collected to determine the effectiveness of the Landfill Operable Unit remedy.
Prepare an Institutional Controls Plan and provide copies of a recent property title search and documents that restrict future use of site property.
Complete the supplemental Ecological Risk Assessment to measure impacts to the Des Plaines River.
Record of Decision to be issued for Groundwater Operable Unit (GWOU).

Protectiveness Statement:

The remedy at the Landfill Operable Unit is expected to be protective of human health and the environment upon attainment of groundwater cleanup goals. In the interim, exposure pathways that could result in unacceptable risks are being controlled by adequate maintenance of the leachate seepage collection system and the landfill cap, and through site access restrictions, institutional controls (believed to be implemented), and O&M activities. A site-wide protectiveness determination will be made: after necessary steps are taken to characterize the nature and extent of recent leachate seepage, after remedial alternatives are implemented to repair the LFOU remedy to curtail seepage and address any resultant contaminated soil, and after the GWOU remedy has been implemented at the Site.

Other Comments:

None.

**BP Amoco Chemical Landfill Site
Joliet, Illinois
First Five-Year Review Report**

I. Introduction

The purpose of the five-year review is to determine whether the remedy at a site is or is expected to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and recommendations to address them.

The Illinois Environmental Protection Agency (Illinois EPA) is preparing this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action (RA) that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such RA no less often than each five years after the initiation of such RA to assure that human health and the environment are being protected by the RA being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The U.S. EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) §300.430(f)(4)(ii) states:

If a RA is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected RA.

The Illinois Environmental Protection Agency conducted a five-year review of the Site, focusing mainly on the RA for the Landfill Operable Unit implemented at the Site. This report documents the results of the review.

This is the first five-year review for the Site. The triggering action for this review is the date of the remedial action start: May 24, 2000.

II. Site Chronology

Table 1. Chronology of Site Events

Event	Date
Waste Disposal Operations at North Landfill	Approx. 1958 - mid 1970s
Waste Disposal Operations at South Landfill	Approx. 1973 - 1975
Initial discovery of contamination	July 1974
Site placed on National Priorities List (NPL)	February 21, 1990
Consent Decree Requiring Remedial Investigation/Feasibility Study	April 7, 1994
Illinois EPA and BP Amoco Chemical Company agree to split the Site into two units: Landfill Operable Unit (LFOU) and Groundwater Operable Unit (GWOU)	Early 1998
Illinois EPA LFOU Remedial Investigation completed	March 25, 1998
Illinois EPA LFOU Focused Feasibility Study completed	October 5, 1998
Record of Decision (ROD) signature for LFOU	July 15, 1999
Remedial Design (RD) for LFOU complete	March 16, 2000
Remedial Action Work Plan for construction of the LFOU remedy approved	March 20, 2000
RD/RA Supplemental Consent Decree for the Landfill Operable Unit Lodged	April 24, 2000
Construction of LFOU remedy started	May 24, 2000
Construction substantially completed	January 23, 2001

III. Background

III.A Physical Characteristics

A manufacturing facility formerly owned by the BP Amoco Chemical Company ("BP Amoco") is located approximately one mile southeast of the intersection of Illinois Route 6 and Interstate Highway 55. It is an active chemical manufacturing facility located on approximately 750 acres of land in a semi-rural industrial/agricultural area. In May 2004 that manufacturing facility was acquired by Flint Hills Resources ("Flint Hills") from BP Amoco.

The manufacturing facility has been in continuous operation since approximately 1958, manufacturing purified isophthalic acid, trimellitic anhydride, maleic anhydride, and polystyrene. The manufacturing wastes generated by the facility were contained in thin-wall, rust away drums and disposed in two landfills (North and South landfills), which were closed in the mid 1970s. The closed landfill areas cover approximately 26 acres (see Figure 1).

The former landfill areas, consisting of two parcels which are roughly triangular in shape, are located in the southern portion of the property. The landfills are located about 600 feet west and northwest of the Des Plaines River on a small bluff. Moving toward the east from the landfills there is a 25-30 foot steep drop in elevation and then the land gently slopes down another 30 feet towards the River.

The landfills are located within an industrial use area currently zoned as "intensive industrial", with adjacent farm fields and "rural residential" land use. The landfills have access that is restricted and monitored through the manufacturing facility's security system. Access is also restricted by the south gate, which borders private property. There is a potential for site access from the river.

III.B Land And Resources Use

The contents of the landfills include approximately 5,900,000 cubic feet (218,518 cubic yards) of wastes, some in 55-gallon drums, including organics, inorganics, heavy metals, acids, and general plant refuse. U.S. EPA suggested in 1983 that 135,000 tons of chemical wastes were probably contained in the landfills, including plasticizers, resins, elastomers, ethers, esters, ketones, aldehydes, and inorganic chemicals (such as salts, asbestos, acids, and heavy metals.).

Specifically, BP Amoco records indicate disposal of solid wastes containing isophthalic, terephthalic, benzoic, toluic and trimellitic acids, aromatic aldehydes, cobalt and manganese acetates, cobalt, manganese, cerium, and "other metal" oxides, sodium bromide, zinc, and "other metal salts", acetic acid, "tar and high boilers", and polystyrene. Liquid slurries and "semisolid" wastes were also disposed which contained many of the above constituents as well as dimethylterephthalate, styrene, mineral oil and rubber, chromium, iron, and copper. Records also indicate that activated carbon (with associated isophthalic and terephthalic acids), construction materials, insulation, and general plant refuse were placed in the landfills. Solid wastes and liquid slurries were reported to have low pH, in the range of 2.5 to 4.8. Because no sampling of the landfill wastes was conducted during the Remedial Investigation and because there is evidence that some hazardous wastes were disposed in the landfills, all landfill contents were assumed to be hazardous wastes, as defined by RCRA.

The northern or main landfill was operated by clearing the shallow soils associated with the former farm land and leveling the areas for disposal of wastes. No liner or clay material was placed beneath the wastes in the northern landfill. In some cases excavations or pits were used for disposal of material. Aerial photos indicate one excavation (approximately 200 feet in diameter) along the east side of the landfill appears to be over 30 feet in depth, while the water table is approximately 20 feet in depth for that area.

In general, waste material, including drums, solids, and some liquids, were placed on the ground surface or in excavations and then covered with stockpiled dirt. The cover material for the northern landfill was excavated from the area now occupied by the southern, smaller landfill area.

In 1972, a large portion of the landfill was closed. This area was leveled, sloped toward the

river, and covered with up to two feet of clayey soil and two feet of clay to reduce infiltration. In 1973, the smaller, southern landfill area began receiving process waste. The clayey soil which was excavated in this smaller triangular area was eventually used as cover material for the landfill to the north. The bottom elevation of the southern landfill area (top of excavated clays) is approximately seven feet below the water table at the north edge. Disposal into the south landfill continued until 1975. The southern landfill was covered in the 1970s.

III.C Initial Response

There have been several documented releases associated with the Site, dating back to July 2, 1974, when the Illinois EPA observed a reddish leachate discharging into the Des Plaines River and traced its origin to the landfill area.

Two separate leachate sources were later identified, one from the closed, the other from the then still active landfill. One of the sources was actually a natural stream, contaminated with seepage from the landfills. This stream contained concentrations of several contaminants in excess of Illinois effluent standards for biological oxygen demand, suspended solids, iron, manganese, phenolics and dissolved solids. Elevated levels of alkalinity, chemical oxygen demand, total organic carbon, chlorides, and cobalt were also detected.

A leachate recovery system was installed by BP Amoco in March 1975. The system was designed to intercept leachate moving laterally down gradient from the bluff area toward the Des Plaines River in the shallow groundwater. The system was upgraded in 1988. Site visits during the mid-1990s indicated the leachate and groundwater was escaping containment as evidenced by iron staining at two locations on the ground surface at the south end of the collection system, and at a small stream outcrop downgradient of the collection system near the backwater area (slough area) east of the landfill.

In March 1987, the U.S. EPA scored the landfills using the hazard ranking system (HRS) and assigned the Site a score of 39.44. A facility which receives a score of 28.5 or higher is a candidate for the National Priorities List (NPL). The Site was placed on the NPL under CERCLA on February 21, 1990.

On April 7, 1994, a Consent Decree (CD) requiring a Remedial Investigation/Feasibility Study (RI/FS) was entered. BP Amoco initiated the RI/FS as stipulated by the CD. In early 1998, an agreement between the Illinois EPA and BP Amoco split the Site into two operable units: the Landfill Operable Unit and the other for the contaminated groundwater (Groundwater Operable Unit). This decision enabled the development of a Focused Feasibility Study (FFS) concerning only capping the landfills. Due to the dispute resolution of irreconcilable differences, the Illinois EPA exercised its rights under the CD and relieved BP Amoco of the task of conducting the RI/FS. The RI was completed on March 25, 1998, and the FFS on October 5, 1998.

A Supplemental Consent Decree for Remedial Design/Remedial Action (RD/RA) for the Landfill Operable Unit was lodged on April 24, 2000. The Remedial Design was completed on March 16, 2000. The Remedial Design specified a cap that conforms to the requirements of RCRA, to be placed on the north and south landfills, and installation of a new leachate collection system along the down gradient side of the south landfill and at the southern end of the north

landfill at two locations of historical leachate seepage.

Construction was started on May 24, 2000. The project suffered numerous delays due to weather, engineering design changes, and a labor strike which resulted in replacement of the construction contractor. As of January 23, 2001, the landfill cap was substantially completed. The final construction inspection was conducted on August 23, 2001.

The manufacturing facility north of the landfill (formerly owned by BP Amoco Chemical; sold to Flint Hills Resources in 2004) is conducting remedial activities under the Illinois EPA Site Remediation Program (SRP). The manufacturing plant portion of the facility entered into the Illinois EPA Pre Notice program (now known as the SRP) officially in November of 1993, primarily in response to a xylene spill in the southeastern portion of the plant area. Groundwater data for the plant area was collected in 1992, 1993 and 1994. This information was used to prepare a Corrective Action Plan that was submitted to the Illinois EPA. In 1998, BP Amoco installed a groundwater recovery trench (GWIT) located to the east of the northern third of the north landfill, and extending north into the manufacturing plant property. The trench is not part of the NPL site remedy.

III.D Basis For Taking Action

The shallow aquifer system beneath the Site consists of two hydrostratigraphic units; unconsolidated glacial deposits (Henry formation), denoted by HSU1, and shallow limestone and dolomite bedrock formations, denoted by HSU2. Both are in hydraulic communication under portions of the landfill. HSU1 has a groundwater divide on the western edge of the north landfill. The upper portion of HSU2 beneath the Site is highly fractured with dissolution and mineralization features present at depth.

A third hydrostratigraphic unit beneath the Site (HSU3), comprising the Scales Shale or Brainard Shale formations, forms a regional and local aquitard between the shallow aquifer system and the deeper bedrock aquifer. The Scales Shale is disrupted by the faulting associated with the Sandwich Fault Zone in the Site area. The Sandwich fault zone strikes southeast to northwest under the landfill. As a result of the fault, in the north portion of the Site the Scales Shale is found at shallow depths (less than 50 feet) and forms the bottom of the shallow aquifer. In the south portion of the Site where the Sandwich Fault has displaced the Scales Shale, the Brainard Shale is found at depths of approximately 100-120 feet. The Brainard shale forms the bottom of the shallow aquifer in the south area of the Site.

Below HSU3 is the regional deep aquifer referred to as the Galena-Platteville-Glenwood-St. Peter Aquifer. The manufacturing facility uses water supplied from production wells completed in this deep aquifer.

Groundwater in the glacial deposits and shallow bedrock generally flows east toward the Des Plaines River. Currently, there are seven residences using groundwater within one mile of the landfill. Based on groundwater flow direction, the wells are not expected to be affected by the landfills. One additional well is located less than one mile southeast of the landfill on the opposite side of the Des Plaines River. The well appears to be located on Stepan Chemical property.

The groundwater in HSU1 and in HSU2 has been contaminated by landfill related contaminants. The depth of contamination of site groundwater below the upper-most weathered and fractured portions of the shallow limestone and dolomite formations is unknown due to lack of monitoring well data. In general, the highest concentrations of contaminants are detected directly adjacent to the landfill boundaries by monitoring wells completed within the shallow glacial deposits of HSU1.

Contaminants of concern for the Site are organic compounds of benzene, toluene, ethylbenzene, xylene, phenol, trimellitic acid, terephthalic acid, benzoic acid, isophthalic acid, phthalic acid, toluic acid, maleic acid, naphthalene, and inorganic compounds of arsenic, cadmium, lead, iron, zinc, cobalt, manganese and chromium. These contaminants have been detected in waste samples, surface soils, groundwater, leachate seep soils, surface water, and in the leachate collection system sump at the Site. The contaminants detected at the Site are consistent with those that were documented in disposal records and spill reports for the facility.

IV. Remedial Actions

IV.A Remedy Selection, Design, and Implementation

IV.A.1 Record of Decision for Landfill Operable Unit

On July 15, 1999, the Illinois EPA signed a ROD selecting a remedy for the LFOU with the concurrence of the U.S. EPA provided on June 24, 1999. The major components of the 1999 ROD included:

- The construction of a RCRA compliant landfill cap conforming to the requirements of 35 Ill. Adm. Code 724;
- Installation of a gas venting system;
- Installation of a new leachate collection system down gradient of the southern landfill and a new leachate collection system down gradient of the southern portion of the north landfill;
- Installation of surface water management features to minimize erosion and infiltration;
- Groundwater monitoring;
- Maintenance of physical access restrictions;
- Real estate deed restrictions.

IV.A.2 Supplemental Consent Decree For LFOU Remedial Design And Remedial Action

A Supplemental Consent Decree ("Supplemental CD") was lodged on April 24, 2000 with BP Amoco Chemical Company. The Supplemental CD committed BP Amoco Chemical to perform the Work as referenced in a Remedial Action Work Plan. The RA Work Plan required construction and implementation of the remedy set forth in the ROD, and achievement of the Performance Standards in accordance with the Supplemental CD, the ROD, the Statement of Work (SOW), and as set forth in the design plans and specifications.

IV.A.3 Remedial Design / Remedial Action for LFOU Remedy

On March 16, 2000, the Illinois EPA approved the 100% Remedial Design. The Remedial Action Work Plan was approved on March 20, 2000, and construction of the LFOU remedy started on May 24, 2000.

IV.A.4 Groundwater Operable Unit Record of Decision

Two operable units have been identified at this site--one for the landfills and the other for the contaminated groundwater. The groundwater operable unit, when formalized, will be evaluated under separate documents, and will be included in the next Five Year Review due in 2010. A remedy for the GWOU will be established by another Record of Decision to be developed and issued before the next Five Year Review in 2010. Development of a ROD for the GWOU will include investigation of groundwater monitoring data and a determination of the LFOU remedy's effectiveness in preventing leaching of contaminants from site waste materials into groundwater.

IV.B. Description of the Current Remedy

IV.B.1 Final Cover System

The Joliet Landfill cover system is comprised of the following components: a vegetative layer of sustained plant growth, a topsoil layer, a rooting zone layer, a drainage layer; a flexible membrane layer (FML); a geosynthetic clay layer (GCL); a passive gas venting system; and a leachate collection system upgrade for the South Landfill. In addition, seep collection tile was also installed along the bluff area to capture two areas of historical seepage.

From top to bottom, the cover system consists of the following materials and layer thicknesses:

- Vegetation Cover;
- Topsoil (6 inches);
- Rooting Zone (30 inches including a 12 inch protective layer);
- Geocomposite drainage layer with geotextile;
- Flexible Membrane Liner *;
- Geocomposite Clay Liner;
- Grading Layer, including a 6 inch bedding layer

* Geomembrane consists of 40-mil LLDPE (Linear low density polyethylene)

IV.B.2 Storm / Surface Water Drainage

One requirement for the LFOU remedy was implementing surface water control measures to minimize erosion and infiltration. Surface water drainage on the landfill cap is controlled by slopes promoting sheet flow towards diversion berms on the landfill cap which direct the runoff to drainage swales on the east side of the landfill or to the Quad Pond Area. The Quad Pond Area is adjacent to and directly west of the landfill. The Quad Pond Area is the location of the former wastewater treatment lagoons for the BP Amoco Chemical Wastewater Treatment Plant for the manufacturing facility. The Quad Ponds were removed from service and closed under the

Illinois EPA Site Remediation Program (SRP). In conjunction with the landfill construction project, the Quad Ponds were regraded and a storm water detention basin was constructed in the Quad Area. The storm water detention basin has a concrete storm water outlet structure and HDPE culvert that directs the discharge to a nearby natural drainage way.

Water that infiltrates through the top soil and rooting zone layer of the landfill cap is diverted to perimeter toe drains. The toe drains have several outlets which discharge to the ground surface outside the landfill perimeter or connect to underground piping for routing to the storm water drainage system.

IV.B.3 Landfill Gas Venting System

As part of the LFOU construction, a passive landfill gas venting system was installed on the landfills. The 100% Design Report characterized the landfill site as having minimal potential for generating landfill gas. The purpose of the gas venting system is to provide effective landfill gas migration control and to prevent physical disruption of landfill cover components resulting from gas migration. A network of gas vents was installed at a grid density of approximately one vent per acre. Existing landfill piezometers were converted to gas probes, and some new probes were installed to monitor for gas build up and lateral migration under the cover.

IV.B.4 Leachate Collection System

The leachate collection system pumps collected leachate to the onsite wastewater treatment plant (currently owned by Flint Hills Resources). The original leachate collection system was installed by BP Amoco around the mid 1970s, and was upgraded to expand the leachate collection piping in the south landfill, abandon and replace the collection sumps in the south landfill with a new leachate pump station (EG-307 pump station), and replace old forcemain and clean-outs with new double walled-transfer pipe and forcemain. The work also included installation of a gravity seep collection system along the forcemain trench, as well as extension up the slope of the bluff on the east side of the landfill to two areas where surficial seeps have occurred. The gravity line drains to the groundwater interceptor trench (GWIT) system, thence to the on-site wastewater treatment plant. Clean-out structures were installed along both the gravity and forcemain lines to allow for maintenance of the system.

IV.C General Operation and Maintenance (O&M) Requirements

IV.C.1 Landfill Cover System

The Illinois EPA has conducted periodic site visits to observe site conditions including the landfill cover system. The most recent site inspection by IEPA was on January 12, 2005 and IEPA contractor personnel (Camp Dresser & McKee, or CDM) inspected the Site on March 17, 2005. A detailed inspection by IEPA personnel was performed on November 3, 2003. Perimeter gates and locks were intact and access was being restricted. The condition of the south landfill cover and slopes was good. At the north landfill, an area where gully erosion was noted at the south storm water diversion dike on previous visits had been repaired with placement of additional soil to redirect the flow along the dike. The Quad Pond storm water detention area was ponded due to recent rain. The storm water detention basin was discharging approximately

50-100 gpm through the orifice at the outlet structure with no unusual conditions noted at the outfall. The storm water drainage ditch along the east side of the north landfill ("East Ditch"), and the drainage swale along the east side of the south landfill were dry, with the riprap in the East Ditch in good condition and both drainage ditch outlets normal. The toe drain outlets for the south landfill and the outlets on the west and northeast side of the north landfill were ponded with no unusual conditions noted. However, at north landfill toe drain outlet "C", some orange discoloration or staining on the concrete was noted where the outlet discharges to an 8 foot diameter concrete manhole. Additional orange staining was noted in a downstream manhole located at what is designated the triangle area. Ponded water was observed where the triangle area outlet discharges to the ground surface. Orange discoloration was observed in the sediment which had accumulated on the rip rap below the outlet. This orange discoloration, which appears to originate from toe drain outlet C, has been observed on previous inspections and has been noted for follow-up.

At the south landfill leachate collection manhole, contributing flows into the manhole were noted as follows: the shallowest collection pipe discharge from the south was dry with no flow. The middle collection pipe from the north had a trickle of flow discharging to the manhole. The deep collection pipe from the west, which is the old existing leachate collection pipe that pre-dates the landfill cap project, was discharging approximately 12 gpm to the leachate collection manhole. The leachate collection system manhole drains through approximately 100 feet of double-walled gravity pipe to the leachate collection system pump station designated as EG-307. At EG-307, orange staining was noted on the sides of the wetwell. Two areas along the bluff, where gravity seep collection pipe was installed at the locations of historical leachate seepage, were found to be dry at the ground surface. The gravity seep collection pipe was observed to be discharging approximately 10 gpm to the GWIT system.

Periodic inspections should continue to monitor the condition of the landfill cover system at the north and south landfills. Inspections should assess the condition of vegetation, perimeter slopes, riprap, toe drain outlets, Quad Pond area, East Ditch and south landfill storm water drainage ditches, triangle area structures and pipes, south landfill leachate collection system, and gravity seep collection system in two areas along the bluff of historical leachate seepage. Any evidence of erosion, tension cracks or cover soil instability, or damage from burrowing animals should be noted for future repair. In addition, depressed areas on the landfill cover system that may pond water should be noted for future repair. The condition of the toe drain outlets should be observed and any necessary follow-up action taken. The bluff area should be inspected at the two locations of historical leachate seepage to verify the gravity seep collection pipe is preventing the seeps from occurring. The bluff area should be checked for the presence of any additional areas of seepage that were not addressed under the landfill cap project. The SOW (Section 1.2.7) states that the surficial seeps should be eliminated as a result of the installation of the new cap and leachate collection system. However, if leachate seeps persist after the completion of the remedial action, under the O & M phase of the project, necessary steps will be taken to characterize the nature and extent of the seepage and remedial actions that will curtail the seepage. During the March 17, 2005 Five Year Inspection, additional areas of leachate seepage were noted (see Attachment 4).

IV.C.2 Landfill Gas Collection System

During the November 3, 2003 site visit, the Illinois EPA observed that HDPE/gravel had been placed around the vent locations. BP Amoco reported that the HDPE/gravel was for health and safety reasons, as some vents were emitting methane, hydrogen sulfide, and carbon dioxide. A chemical odor was detected at gas vent GV-14 on the north landfill. No odors were detected at other vents.

The SOW requires the quality of gas emitted from the gas venting system to be monitored semi-annually for a period of two years. If deemed necessary to protect human health and the environment, an active gas collection and treatment system will be designed and implemented. The data has been collected and results indicate no impact to off-site receptors.

IV.C.3 Interim Ground Water Monitoring

Following completion of construction of the landfill cap, the project entered the interim groundwater monitoring period with groundwater monitoring performed on a quarterly basis to assess the effectiveness of the landfill cap. The Illinois EPA and its contractor, Camp Dresser & McKee (CDM), have performed quality assurance oversight during the quarterly ground water sampling events. The interim groundwater monitoring program was approved by Illinois EPA on November 9, 2001, and some new groundwater monitoring wells and piezometers were installed in November and December 2001. The interim groundwater monitoring was initiated in December 2001.

V. Progress Since the Last Review

This is the first five-year review for this site.

VI. Five-Year Review Process

VI.A. Administrative Components

The Illinois EPA is the lead agency for this five-year review. The support agency is the U.S.EPA. The U.S. EPA and BP Amoco were notified in mid 2005 of the five-year review.

Camp, Dresser & McKee, as contractor to the Illinois EPA, performed most of the tasks required for the review. The review consisted of the following components:

- Community Notification and Involvement
- Document Review
- Data Review
- Site Inspection
- Five-Year Review Report Development and Review

VI. B. Community Notification and Involvement

A notice was published in the Joliet Herald News on August 25, 2005, stating that a five-year review was being conducted. The notice invited the public to submit comments to the Illinois EPA by September 15, 2005. No comments from the community were received by the Illinois EPA or U.S. EPA. The results of the review and this Five-Year Review Report will be placed in the site repository located at the Three Rivers Public Library, 25207 West Channon Drive, Channahon, Illinois, or the Illinois EPA Headquarters, 1021 North Grand Avenue East, Springfield, Illinois. A copy of the published notice can be found as Attachment 3.

VI.C. Document Review

The list of the documents that were reviewed for this five-year review can be found in Attachment 2.

VI.D. Data Review

The primary objective of the LFOU remedy is to control the landfills as a source of continuing groundwater contamination by reducing the infiltration of rainfall and reducing the quantity of leachate migrating from the Site. A quarterly groundwater monitoring program has been in place since implementation of the remedy and provides the data utilized in this analysis. The overall objective of the five-year review process is to evaluate if the remedy, as implemented, is or will be protective of human health and the environment. The guidance document for the five-year review process (U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, June 2001, Comprehensive Five-Year Review Guidance, OSWER No. 9355.7-03B-P, EPA 540-R-01-007) indicates that this evaluation is based on the risk range and hazard index. This review focuses on using site monitoring data to determine if the remedy has had an impact on either groundwater levels or groundwater quality. Ideally, if the remedy is meeting its stated intention in the ROD, recharge through the waste materials should decrease since a multilayer RCRA cap was installed. Likewise, under ideal circumstances, a decrease in concentrations of site contaminants at downgradient monitoring wells should be observed at some point after remedy implementation. It should be noted that the remedy did not include a liner or other means of limiting recharge from leachate that may have been present in the waste, or areas where the waste may be within the saturated zone. Natural systems also may require significant time to equilibrate with changes in conditions, such as a change in the recharge rate. Variability in rainfall will also impact the response of the system to the remedy implementation. During the five year period since the year 2000, precipitation has been variable. Water level records were plotted at selected monitoring wells at the Site over the past five years (see Appendix A).

The groundwater system at the Site consists of an upper unit comprised of saturated, unconsolidated material and shallow weathered bedrock (HSU1), underlain by deeper fractured bedrock (HSU2). Several wells at the Site monitor a transition zone between the major hydrostratigraphic units. The landfill is located on an upland area and waste may be in contact with the upper aquifer unit in some locations. Hydrographs of water level elevation over time, indicate that seasonal factors are important at the Site and must be considered in evaluating the effectiveness of the remedy. The hydrographs were examined to qualitatively assess trends. None of the hydrographs have discernable rising trend, outside of that noted from a drought

recovery in 2002. Several of the wells show apparent declining trends, namely, MW-109-01 in HSU1 and wells MW-95-98, MW-94-98, and MW-86-98 in HSU2. Well MW-109-01 is located near the Quad Pond area and may reflect impacts from dewatering and closing the former Quad Ponds. Wells MW-94-98 and MW-95-89 are also located west of the Quad Pond area and may reflect impacts from this closure. Well MW-86-98 is located near the GWIT and may be impacted by its operations. Water level contour maps are developed by BP Amoco for each monitoring period for specific aquifer intervals. These maps indicate that relatively consistent flow directions and gradients have been maintained during the past five years. A well pair is located east of the capped landfill area that is suitable for evaluation of vertical hydraulic gradients within HSU2. Wells MW-98-99 and MW-88-98 are adjacent and have screen zones separated by about 20 feet. These wells have indicated a potential for downward flow during the past five years (see Appendix A).

The contaminants of concern at the Site include organic acids, volatile organic compounds and metals. Metals are detected at many of the wells, especially iron and manganese, likely due to the highly reducing environment that has developed due to the landfill leachate. VOCs are sporadically detected at the Site, though below action levels. Benzene, chlorobenzene, toluene and xylene have been detected in several samples during the past five years at low levels. The principal compounds of concern that are detected at the Site are organic acids, with isophthalic acid and phthalic acid occurring above their comparison values (see Appendix B).

Isophthalic acid has been detected at concentrations up to 47.9 µg/ml at well MW-109-01. The comparison value for this compound is 7 µg/ml, and the proposed Preliminary Remediation Goal (PRG) cited in the 1999 ROD is 1.669 µg/ml. A comparison value is the concentration of a contaminant that can potentially cause an adverse health effect in the unlikely event that a human is exposed to that contaminant. A comparison value is based on the contaminant's toxicity and potential for human exposure. This compound has been detected above the comparison value at wells MW-97R-00, MW-98-99, MW-99R-00, MW-100-99, MW-100-99, MW-101-99, MW-102-99, MW-103-01, MW-108-01 and MW-109-01. Wells MW-109-01 and MW-102-99, located west of the landfill area have had the most consistent elevated concentrations for this compound.

Phthalic acid has been detected at concentrations up to 589 µg/ml at well MW-99R-00, located east of the landfill. Phthalic acid has been detected above the 7 µg/ml comparison value at wells MW-101-99, MW-109-01, MW-97R-00, MW-98-99, and MW-99R-00. Wells MW-109-01, 97R-00 and MW-99R-00 have had more than three periods that exceeded the comparison value of Phthalic Acid. The extreme values detected for several of the samples appear to be outliers, and were not repeated. Seasonal variability is apparent on many of these wells, suggesting that variations in recharge are impacting concentrations at the Site. The season where peak concentrations occur is variable both for individual wells and between wells. For these reasons, statistical trend testing has limited applicability to these data, however, qualitative visual inspection of the trends suggests that there are some increasing or decreasing trends present. Many of the wells with detections showed an increase in phthalic acid and a less consistent increase in isophthalic acid during 2004 when rainfall increased. The values peaked and then decreased later in 2004, suggesting that increased recharge plays a role in mobilizing contaminants at the Site. Wells with a longer term suggestion of increasing concentrations exceeding or approaching the comparison level include MW-101-99, MW-100-99, MW-88-98

and MW-108-01. Wells with a longer term suggestion of declining concentrations near comparison levels include MW-99R-00, MW-97R-00 and MW-109-01. It should be noted that the variability in precipitation and time required for the system to equilibrate impact these potential trends.

Based on analysis of monitoring data at the Site, it is difficult to definitively state that the remedy is meeting its objective of protection of human health and the environment. Organic acids at concentrations that exceed comparison values are present outside of the landfill. However, this may be due to continued drainage of leachate from the waste, or groundwater levels rising into the waste materials, rather than failure of the capping or leachate collection systems.

VI.E. Site Inspection

A site inspection was completed on March 17, 2005. Participants and affiliations were as follows:

Chris Martel	Camp, Dresser & McKee	Illinois EPA oversight contractor
Shawn Shiffer	Camp, Dresser & McKee	Illinois EPA oversight contractor
Greg Chodil	BP Amoco	BP representative
Roger Beck	Retec	BP's technical consultant

The inspection was conducted according to the checklist provided in Appendix D of the Comprehensive Five-Year Guidance provided by the U.S. EPA.

After the review of the checklist was complete, the attendees performed a walkover of each landfill. The landfills were checked to visually observe that they were operating as designed and to check for previously unseen problems. Pictures were taken by CDM that would aid in the description of the landfill conditions in this report (see Attachment 4).

The landfill covers were inspected for low areas and areas of stressed or different ground cover to determine if landfill settlement had occurred since installation of the landfill cap. There was no evidence of significant settlement observed. However, due to large amounts of vegetation lying on the ground, small changes in elevation or settlement were not detectable. There was no evidence of wet areas or water damage observed on the landfill covers. The covers did show signs of deer activity as evidenced by several deer tracks running across the landfill. Several items identified in the inspection report (listed under Section VIII) warrant further follow-up.

VI.F. Interviews

From 1999 to 2001, during the design and construction of the remedy, the community surrounding the Site was given opportunity to provide input into development of the remedy and express any concerns or questions about the Site. Since the achievement of the last construction completion in 2001, there have been no major problems communicated to the regulatory agencies by the community. The need has not arisen for any community involvement events and the proximity of the Illinois EPA's offices to the Site facilitates the agency's availability. Therefore, it was determined that no formal interviews with the community were necessary for

this five-year review. No formal interviews with the U.S. EPA or BP Amoco were performed for this five-year review.

VII. Technical Assessment

VII.A Question A: Is The Remedy Functioning As Intended By The Decision Documents?

Remedial Action Performance

The review of documents, ARARs, risk assumptions, and the results of the site inspection indicate that the remedy is functioning as intended by the ROD, subject to the issues and comments provided in Section VIII.

System Operations/O&M

Based on periodic site visits and the March 17, 2005 Five Year Review Inspection, the landfill cover system and gas venting system are generally functioning as intended by the ROD and other decision documents. No significant problems have been observed. As a result, no significant future modifications are recommended for the landfill cover system or gas venting system at this time.

Opportunities for Optimization

There were no opportunities for system optimization observed during this review. Opportunities for optimization will be re-assessed no later than the next Five Year Review in 2010.

Implementation of Institutional Controls and Other Measures

Based on available information, the institutional controls that are in place include restrictive easements and covenants, and Environmental Land Use Covenants limiting on-site groundwater use, and limitations on the disturbance of the landfills and other activities that might interfere with the implemented remedy. It should be noted that whatever restrictions have been implemented by BP Amoco were not available for review in this report. No evidence was observed that suggested that there was any land or resource use which is inconsistent with the remedial action objectives. Consistent with updated U.S. EPA policy and guidance, to ensure that adequate institutional controls are in place and will be properly maintained, an Institutional Controls Plan will be developed for the Site. At a minimum, this IC Plan will consist of: a current title search and title commitment for the Site, a summary of existing institutional controls such as the current land use restrictions implemented by BP Amoco, a summary of proprietary controls such as easements, covenants, and/or reversionary interests currently assigned to the land, a summary of any local ordinances or property zoning applicable to the Site property, and a summary of the resources available to BP Amoco to ensure future implementation and maintenance of Site institutional controls.

The re-use initiative is a consideration for this Site. Future decisions regarding re-use of the Site will consider the requirement for the remedy to remain protective of human health and the environment. However, because the site property is privately owned and is currently subject to land use restrictions, and because a Record of Decision has not been developed or issued for the GWOU, it is likely that re-use of the site property will not be implemented before the next Five

Year Review in 2010. Residential development on this site is not consistent with current or projected land use patterns.

Interim Monitoring

Interim monitoring of the monitoring well network has been performed quarterly since December 2001 under the supervision of Camp, Dresser & McKee, as oversight contractor for the Illinois EPA. Based on analysis of monitoring data at the Site, it is difficult to definitively state that the remedy is meeting its objective of protection of human health and the environment. Concentrations of organic acids in excess of comparison values are present outside of the landfill. However, this may be due to continued drainage of leachate from the waste or from groundwater rising into the waste materials, and not due to failure of the capping or leachate collection systems.

Two operable units have been identified at this site--one for the landfills and the other for the contaminated groundwater. The assessment included in this document focuses on the landfill operable unit. The groundwater operable unit, when formalized, will be evaluated under separate documents, and will be included in the next Five Year Review due in 2010. A remedy for the GWOU will be established by another Record of Decision, to be developed and issued before the next Five Year Review in 2010. Development of a ROD for the GWOU will include investigation of groundwater monitoring data and a determination of the LFOU remedy's effectiveness in preventing site waste materials from leaching contaminants into groundwater.

VII.B Question B: Are The Exposure Assumptions, Toxicity Data, Cleanup Levels, And Remedial Action Objectives (RAOs) Used At The Time Of Remedy Selection Still Valid?

There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy.

Changes in Standards and To-Be-Considereds (TBCs)

There have been no changes in ARARs for groundwater cited in the ROD and no new standards or TBCs affecting the protectiveness of the remedy.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The exposure assumptions used to develop the Human Health Risk Assessment included both current exposures and potential future exposures for ingestion of contaminated groundwater, dermal contact with contaminated groundwater, inhalation of volatile contaminants during domestic use of groundwater, incidental ingestion of contaminated surface water in seeps and the Des Plaines River, and incidental ingestion of sediment in seeps and the Des Plaines River. There have been no changes in the toxicity factors for the contaminants of concern that could affect the protectiveness of the remedy. These assumptions are considered to be conservative and reasonable in evaluating risk, and no changes are warranted.

Physical controls (such as site access control and site security) have already been implemented and have eliminated exposure pathways at the Site. Institutional controls (such as deed and land use restrictions) may have already been implemented, although their current and future

effectiveness needs to be evaluated. These measures currently insure that the LFOU remedy remains protective of human health and the environment.

Changes in Risk Assessment Methods

There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

Expected Progress Towards Meeting RAOs

Although no site remedy decision document issued by U.S. EPA defines the estimated remedy time period needed to achieve cleanup goals, it is possible that long term operation and maintenance at the Site may continue until the year 2031. No formal estimates for the time requirement to achieve for remedy objectives have been made. For this site it is assumed that remedy objectives will be obtained in not more than 30 years from the date of the completion of remedy construction.

VII.C Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

As indicated in the ROD, the Baseline Risk Assessment concludes that for protection of ecological resources, control of: (1) Site runoff, (2) leachate discharges to the surface (via leachate seeps), (3) sediment transport to the Des Plaines River and its associated backwaters, and (4) groundwater discharges to surface water bodies are most critical. Potential sediment-related impacts to the Des Plaines River will be assessed in a forthcoming supplemental Ecological Risk Assessment.

Leachate seeps, as noted in the March 17, 2005 Five Year Inspection Report, will be addressed through necessary steps to characterize the nature and extent of seepage and through remedial alternatives to curtail the seepage. From May to June 2004, BP Amoco changed the leachate seepage collection system without review, approval, or oversight by the Illinois EPA. During a site visit on January 12, 2005, the Illinois EPA observed a surcharge condition in the leachate seepage collection system. The surcharge condition may have contributed to soil and groundwater impacts from leachate seepage. BP Amoco agreed to evaluate the surcharge condition including the potential impacts to soil and groundwater. The Illinois EPA directed BP Amoco to provide design and construction information for the changes made to the leachate seepage collection system, and a contingency plan to prevent surcharge conditions from occurring in the future. BP Amoco provided a contingency plan in several submittals; the most recent is dated July 29, 2005. BP Amoco provided construction reports in several submittals; the most recent is dated March 31, 2005. These are currently under review by the Illinois EPA. This leachate seepage collection issue affects current and future protectiveness of the LFOU remedy and warrants continued follow-up.

Based on analysis of monitoring data at the Site, it is difficult to definitively state that the remedy is meeting its objective of protection of human health and the environment. Organic acids at concentrations that exceed comparison values are present outside of the landfill. However, this may be due to continued drainage of leachate from the waste, or groundwater levels rising into the waste materials, rather than failure of the capping or leachate collection systems. The LFOU remedy is expected to be protective when issues listed in Section VIII are satisfactorily

addressed. A Record of Decision establishing a remedy for the GWOU will be issued before the next Five Year Review in 2010. A site-wide protectiveness determination will be made in the next Five Year Review. In the interim, exposure pathways are being controlled through site security and probably through institutional controls; however, since the institutional control documents were not available for evaluation at the time that this report was issued, this issue will be the subject of follow-up activities.

VIII. Issues

1. Site Documents & Records.

A.) Based on CDM discussions with Retec and BP Amoco during the March 17, 2005 inspection, O&M documents are not kept on-site. The O&M documents that were previously maintained at the BP Amoco manufacturing facility (now owned by Flint Hills Resources), are currently available through Conestoga-Rovers and Associates, technical consultant for BP Amoco.

B.) The Site Specific Health and Safety Plan and Contingency/Emergency Response Plan is reportedly kept on site, but the location (site trailer) was not accessible at the time of the March 17, 2005 inspection.

C.) The O & M and safety training records were not available.

D.) Permits and Service Agreements including the air discharge permit and leachate discharge service agreement were not available on-site. Based on CDM discussions with BP Amoco, the landfill gas vents were included under the air discharge permit for the former BP Amoco manufacturing facility; the permit will need to be changed. The leachate collection system currently discharges into the Flint Hills Wastewater Treatment plant in accordance with a sales agreement; however this will discontinue within the year. BP Amoco is in the process of providing alternate treatment for the leachate collection system, consisting of a stand-alone treatment plant with a permitted discharge to the Des Plaines River, or a sewer connection to the City of Joliet Publicly Owned Treatment Works. BP Amoco will need to obtain all necessary permits and approvals from the Illinois EPA and others as appropriate.

E.) Leachate extraction records for the leachate collection system were not available.

F.) Discharge compliance records for the air permit and leachate discharge service agreement were not available. This information was previously available at the former BP Amoco manufacturing facility, now owned by Flint Hills Resources.

G.) Copies of a recent title search and any deed restrictions/institutional controls that have been or will be implemented for the site property should be made available to the Illinois EPA. BP Amoco will be requested to conduct an institutional controls study for the Site, in accordance with U.S. EPA guidance.

In summary, the Illinois EPA will request BP Amoco, within a 30 day timeframe or longer if agreed to by Illinois EPA, to collect and maintain the above referenced records on-site in such a

manner as they are readily available for inspection by Illinois EPA at all reasonable times. The Supplemental Consent Decree requires BP Amoco to provide information relating to activities at the Site, et alia, upon request by the State.

2. General Site Conditions.

A.) During the March 17, 2005 inspection, the access roads along the perimeter of the north and south landfills and in the lower portion of the Site to the east of the bluff area were found to be heavily rutted due to weathering and in need of repair. BP Amoco and Retec had indicated the road would be repaired later in the spring. This should be verified.

B.) According to BP Amoco personnel, mowing of the landfill cap was not conducted in the 2004 season. Due to lack of mowing, the grass cover was overgrown and had fallen to the ground during the fall and winter. This ground cover made inspection of the landfill and surrounding areas difficult. BP Amoco will be instructed to mow the landfill cap at a minimum on an annual basis to facilitate inspection of the cover.

3. Landfill Surface.

A.) During the March 17, 2005 inspection, the north and south landfill areas were inspected for low areas and areas of stressed or different groundcover to determine if landfill settlement had occurred since installation of the landfill cap. There was no evidence of significant settlement observed; however due to large amounts of the ground cover lying on the ground, small changes in elevation or settlement were not detectable.

B.) There are several deer tracks running across the landfill and evidence of deer inhabitation. These tracks are areas of reduced vegetation and slight depressions that warrant continued observation. In addition to the deer tracks, small areas of slightly sparse vegetation were observed on the southeast and southwest corners of the north landfill and along the northeast corner of the north landfill. These areas warrant continued observation.

C.) Based on CDM discussions with BP Amoco, landfill settlement monitoring has not been conducted. BP Amoco will be directed to collect settlement monument survey data as part of the Site's O & M.

4. Leachate Seepage.

A.) During May to June 2004, BP Amoco made some changes to the leachate seepage collection system without the review, approval, and oversight by the Illinois EPA. During a site visit on January 12, 2005, the Illinois EPA observed a surcharge condition in the leachate seepage collection system, suggesting that the changes to the system do not function properly. The surcharge condition may have contributed to soil and groundwater impacts along the east side of the landfill from leachate seepage. BP Amoco agreed to evaluate the surcharge condition, including impacted soils. The Illinois EPA directed BP Amoco to provide design and construction information for the changes made to the leachate seepage collection system, and a contingency plan to prevent surcharge conditions from occurring in the future. BP Amoco provided a contingency plan in several submittals; the most recent dated July 29, 2005. BP

Amoco provided construction reports in several submittals; the most recent dated March 31, 2005. These are currently under review by the Illinois EPA. This issue affects current and future protectiveness of the remedy, and warrants continued follow-up.

B.) During the March 17, 2005 site inspection, CDM observed several seeps, wet areas, and areas of ponding to the east of the landfill below the bluff. The most significant area of concern was the drainage ditch along the lower access road which had staining on the rip rap and discoloration of the water in the ditch. This discoloration appeared to originate at seeps located along the slope of the bluff which borders the north landfill. Several other areas to the south showed evidence of staining on the soil and discolored seepage water along the bluff which borders the landfills. The Illinois EPA will direct BP Amoco to investigate these areas and provide appropriate remedial alternatives to curtail the seepage. This finding affects current and future protectiveness of the remedy, and warrants continued follow-up.

5. Perimeter ditches.

One small area of erosion was observed at the edge of the drainage ditch for the North landfill (East Ditch). This area warrants continued observation, and will be addressed by BP Amoco as part of the required continuous O&M activity for the LFOU remedy.

6. Groundwater Monitoring.

A.) Piezometers PZ-13, 14, 15, 16, 17 did not have locks. The interior cap of PZ-17 was not secured. This will be corrected.

B.) Quarterly groundwater monitoring has been conducted since the completion of the landfill cap in December 2001. At this time it is difficult to determine whether the LFOU remedy has had a significant impact on groundwater contamination. Water levels and contaminant concentrations have varied significantly and contaminant concentrations have exceeded the proposed remediation goals in monitoring wells downgradient of the landfill. Quarterly groundwater monitoring should be conducted until sufficient data has been collected to determine the effectiveness of the remedy. The groundwater operable unit will be evaluated under separate documents and will be included in the next Five Year Review, due in 2010. A remedy for the GWOU will be established by another Record of Decision, to be developed and issued before the next Five Year Review in 2010. Development of a ROD for the GWOU will include investigation of groundwater monitoring data and a determination of the LFOU remedy's effectiveness in preventing leaching of contaminants from site waste materials into groundwater.

7. Ecological Risk Assessment.

The Illinois EPA is working with BP Amoco to determine if the landfills have impacted the sediment in a backwater slough area of the Des Plaines River. Potential sediment-related impacts to the Des Plaines River from the Site will be assessed in a forthcoming supplemental Ecological Risk Assessment.

8. Groundwater Operable Unit Record of Decision.

The GWOU will be evaluated under separate documents and a remedy selected and implemented before the next Five Year Review due in 2010. A remedy for the GWOU will be established by another Record of Decision. Development of a ROD for the GWOU will include investigation of groundwater monitoring data and a determination of the LFOU remedy's effectiveness in preventing site waste materials from leaching contaminants into groundwater.

IX. Recommendations and Follow-up Actions

Table 2. Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
<u>1. Site Documents and Records</u> 1.A. O&M Documents 1.B. Site Health and Safety Plan 1.C. Training and health and safety records 1.E. Leachate Extraction Records 1.F. Discharge compliance records for air and leachate.	Collect and maintain referenced records on-site in such a manner to be readily available for inspection by IEPA at all reasonable times.	BP Amoco	IEPA and U.S. EPA	December 2005	N	N
<u>1. Site Documents and Records</u> 1.D. Air Permits and Service Agreements for Landfill	Submit application for: - Air Discharge Permit. - Discharge Service Agreement or Discharge Permit to City of Joliet sewer or to Des Plaines River for Treated Leachate.	BP Amoco	IEPA and City of Joliet	December 2005	N	Y

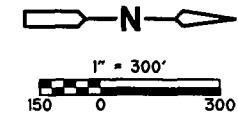
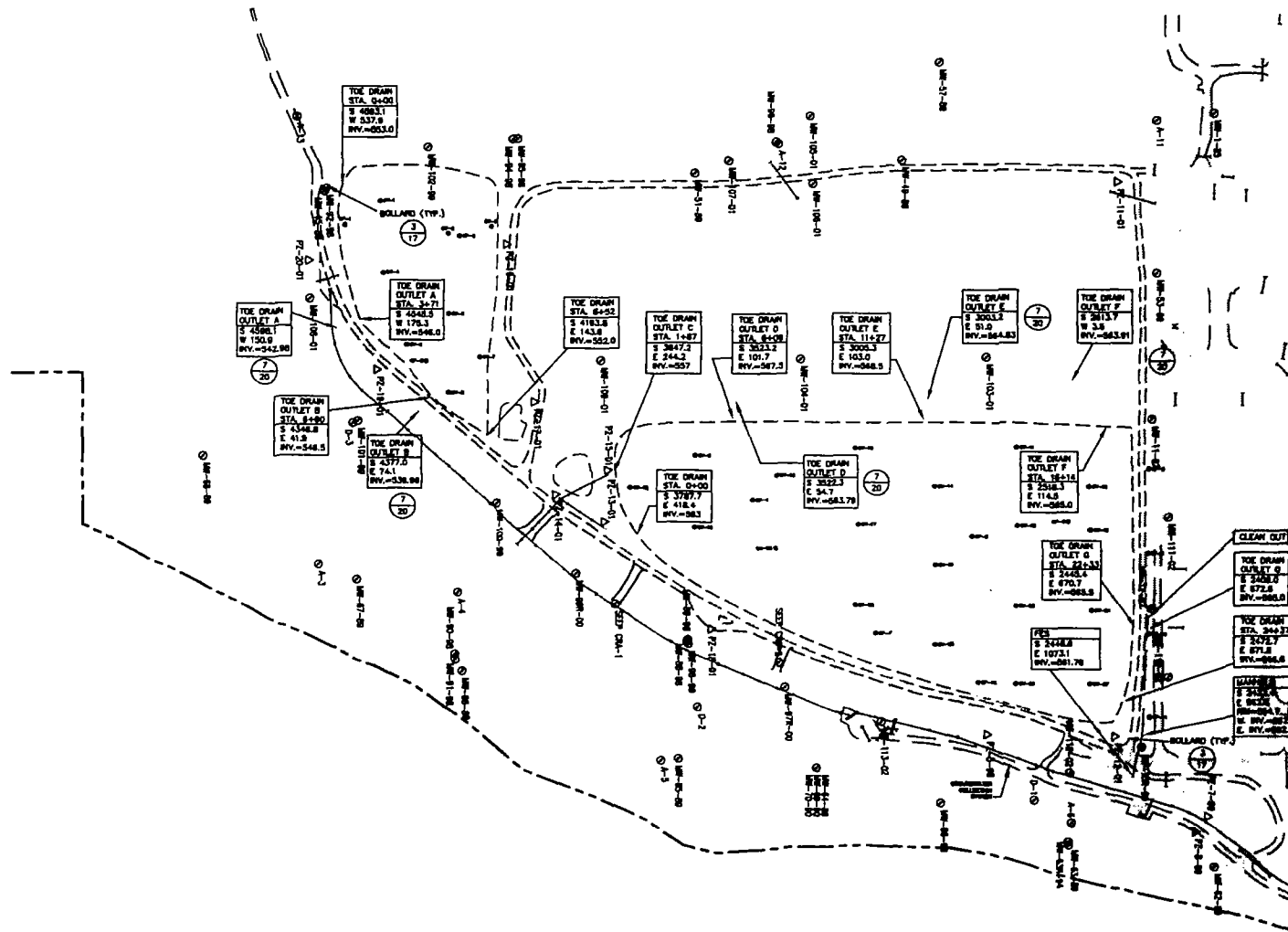
Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
<u>1. Site Documents and Records</u> 1.G. Title search and institutional controls (IC) documents, including an IC Plan	Develop an IC Plan that includes: - Recent Title Search Showing Proprietary Controls. - Current Deed Restrictions. - Local ordinances or property zoning. - Resources for existing/future ICs.	BP Amoco	IEPA and U.S. EPA	March 2006	N	Y
2.A. <u>Access Roads</u>	Repair ruts on access roads and maintain the roads.	BP Amoco	IEPA and U.S. EPA	December 2005 and as needed	N	N
2.B. <u>Grass Cover</u>	Mow the landfill cap at a minimum on an annual basis.	BP Amoco	IEPA and U.S. EPA	December 2005, minimum annually	N	N
3. <u>Landfill Surface</u>	Continued observation of deer tracks, small areas of slightly sparse vegetation on the southeast and southwest corners of the north landfill and along the northeast corner of the north landfill; take corrective actions as necessary.	BP Amoco	IEPA and U.S. EPA	December 2005 and annually	N	N
3.C. <u>Landfill surface</u>	Collect settlement monument survey data as part of the Site's O&M.	BP Amoco	IEPA and U.S. EPA	December 2005 and annually	N	N
4.A. <u>Leachate Seepage Collection System</u>	Address changes made to the leachate seepage collection system. Implement an approved contingency plan to prevent surcharge conditions from occurring in the future.	BP Amoco	IEPA and U.S. EPA	September 2006 December 2005	Y	Y

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
4.B. <u>Leachate Seepage</u>	Characterize the nature and extent of the seepage (including contaminated soil) and identify remedial alternatives that will curtail the seepage and address soil contamination. Implement remedial alternatives.	BP Amoco	IEPA and U.S. EPA	March 2007 September 2007	Y	Y
5. <u>Perimeter Ditches</u>	Monitor area of erosion on the East Ditch; take corrective actions as necessary.	BP Amoco	IEPA and U.S. EPA	December 2005 and annually	N	N
6.A. <u>Groundwater Monitoring</u>	Provide locks for PZ-13, 14, 15, 16, 17. Secure cap on PZ-17.	BP Amoco	IEPA and U.S. EPA	December 2005	N	N
6.B. <u>Groundwater Monitoring</u>	Continue until sufficient data has been collected to determine the effectiveness of the Landfill Operable Unit remedy.	BP Amoco	IEPA and U.S. EPA	Quarterly	N	N
7. <u>Ecological Risk Assessment</u>	Assessment of potential sediment-related impacts to the Des Plaines River from the Site.	BP Amoco	IEPA	December 2006	N	Y
8. <u>GWOU Record of Decision</u>	Evaluation of groundwater monitoring data and effectiveness of LFOU remedy in controlling source material.	IEPA and U.S. EPA	IEPA and U.S. EPA	Prior to September 2010	N	Y

Attachment 1 – Figure 1, Site Map

S:\1681\33487\ SITE3 08/19/05 17:16 seligarb XREFS: SP002, BORING-LOCS

CDM



LEGEND:

- BOUNDARY
- LANDFILL/MINICAP LIMITS
- MONITORING WELL
- △ PIEZOMETER
- GAS VENT
- GAS PROBE

NOTE:

ADAPTED FROM RECORD DRAWING D-85-1451, FINAL CONSTRUCTION REPORT LANDFILL CAP AND QUAD REGRADING, BP JOLIET LANDFILL SUPERFUND SITE, JOLIET, ILLINOIS, CONESTOGA-ROVERS & ASSOCIATES, DECEMBER 2001.

Figure 1
SITE MAP
BP Amoco Joliet Landfill Site/Joliet, IL
1978000001/Will County

Attachment 2: List of Documents Reviewed

1. Supplemental Consent Decree for Remedial Design and Remedial Action, People of the State of Illinois vs. BP Amoco Chemical Company, U.S. District Court for the Northern District of Illinois, Eastern Division, Civil Action 94-C-0869.
2. Record of Decision for Amoco Chemicals (Joliet Landfill) Superfund Site, Landfill Operable Unit, July 15, 1999.
3. Statement of Work for BP Amoco Chemicals (Joliet Landfill) Superfund Site, Landfill Operable Unit, May 24, 2000.
4. Final (100%) Design Report, BP Amoco Joliet Landfill Superfund Site, Joliet Illinois, CRA, June 1999.
5. Remedial Action Work Plan (RAWP), BP Amoco Joliet Landfill Superfund Site, Joliet Illinois, as amended, CRA July 1999.
6. Five Year Review, Landfill Inspection and Groundwater Impacts, CDM, August 19, 2005.
7. Correspondence, Illinois EPA to BP, March 1, 2005.
8. Correspondence, Illinois EPA to BP, May 12, 2005.
9. Correspondence, Illinois EPA to BP, June 6, 2005.

IEPA Begins Review of BP Amoco Joliet Landfill Superfund Site Joliet, Illinois

The Illinois Environmental Protection Agency (IEPA) is accepting information and comments for its five-year review of the BP Amoco Joliet Landfill Superfund Site until **September 15, 2005**. The site is located in Will County approximately 1.5 miles southeast of the intersection of Interstate 55 and U.S. Route 6. The Superfund law requires regular review of all sites where cleanup construction is complete. These reviews, usually every five years, are done to ensure that the cleanup remedy continues to protect human health and the environment. Briefly, the cleanup included:

- The construction of a landfill cap conforming to applicable requirements;
- Installation of a gas venting system;
- Installation of a new leachate collection system down gradient of the southern landfill and a new leachate collection system down gradient of the southern portion of the north landfill (leachate is defined as any liquid that comes into contact with waste in the landfill);
- Installation of surface water management features to minimize erosion and infiltration;
- Groundwater monitoring;
- Maintained physical access restrictions; and
- Real estate deed restrictions.

Please share this information regarding the five-year review with anyone interested in this site.

Site related documents can be reviewed at the information repository at the Three Rivers Public Library, 25207 West Channon Drive, Channahon, Illinois or at the IEPA Headquarters, 1021 North Grand Avenue East, Springfield, Illinois.

To provide comments or to request information, contact:

Sandra Bron
IEPA Project Coordinator
POB 19276
Springfield IL 62794-9276
217.557.3199
Sandra.Bron@epa.state.il.us

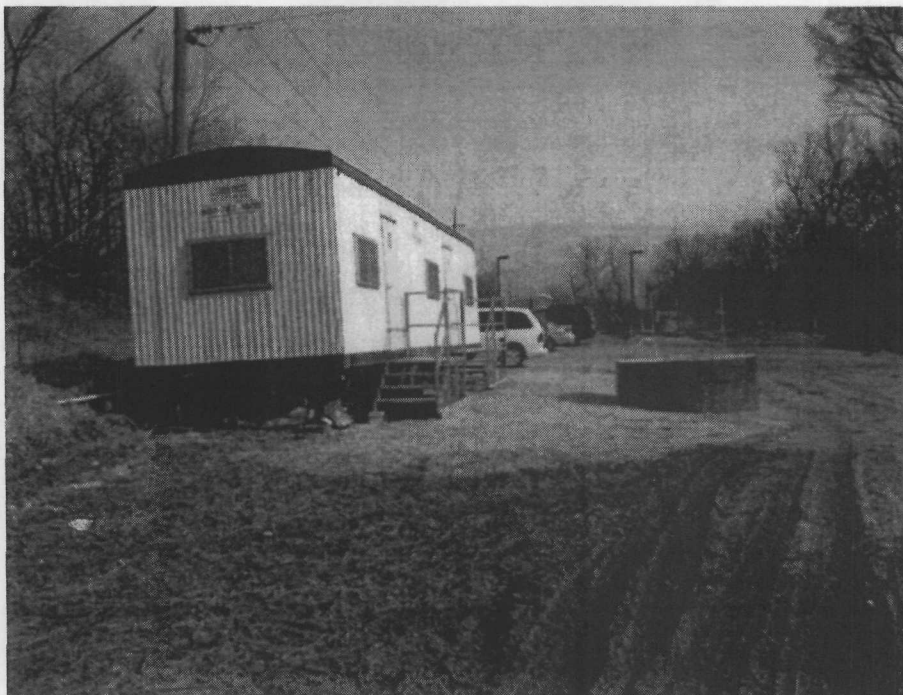
Bill Hammel
IEPA Community Relations Coordinator
POB 19276
Springfield IL 62794-9276
217.785.3924
Bill.Hammel@epa.state.il.us

ATTACHMENT 4
PHOTOS DOCUMENTING SITE CONDITIONS
FIELD PHOTOGRAPH LOG

Photograph #1

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Site trailer and Collection Manhole located south of EG-324.

Photograph #2

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



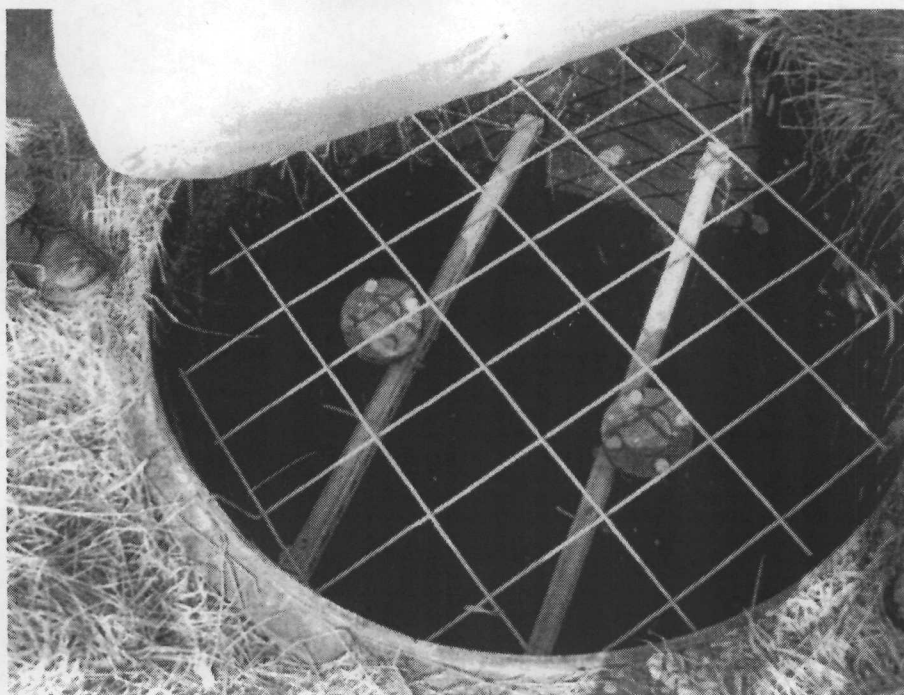
Photograph Description: Area south of bluff where the low area was wet, but no visible seeps were observed.

FIELD PHOTOGRAPH LOG

Photograph #3

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

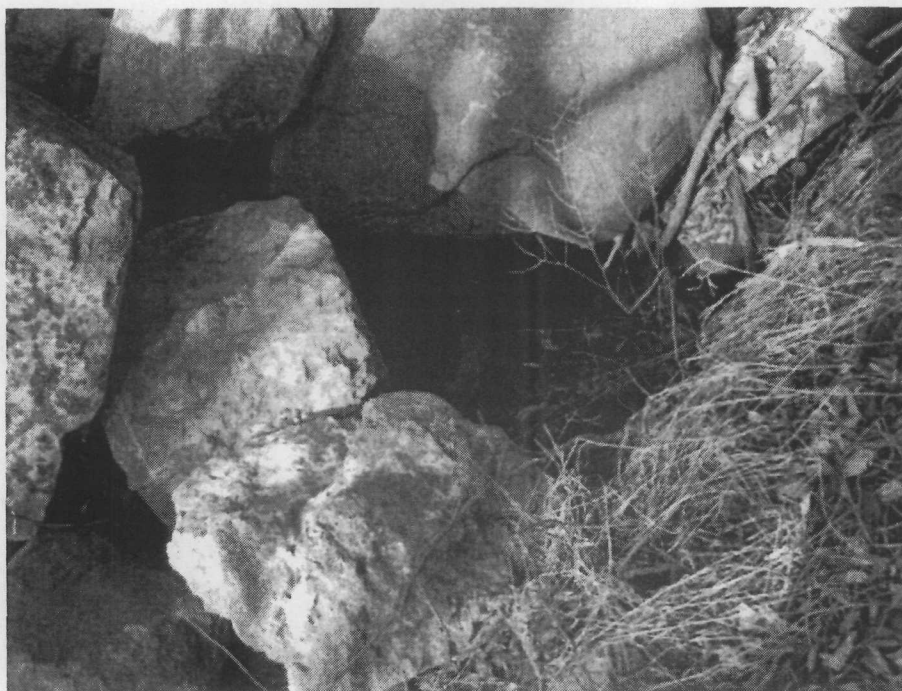


Photograph Description: Interior of COV 13.

Photograph #4

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Gully located south of COV 13 on the bluff with a small amount of discolored water in the rocks.

FIELD PHOTOGRAPH LOG

Photograph #5

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Triangle Area Culvert east of the bluff.

Photograph #6

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Water flowing from the Triangle Area Culvert.

FIELD PHOTOGRAPH LOG

Photograph #7

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Gravel that has extended past the road edge east along the bluff.

Photograph #8

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Water flowing from Toe Drain Outlet B.

FIELD PHOTOGRAPH LOG

Photograph #9

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

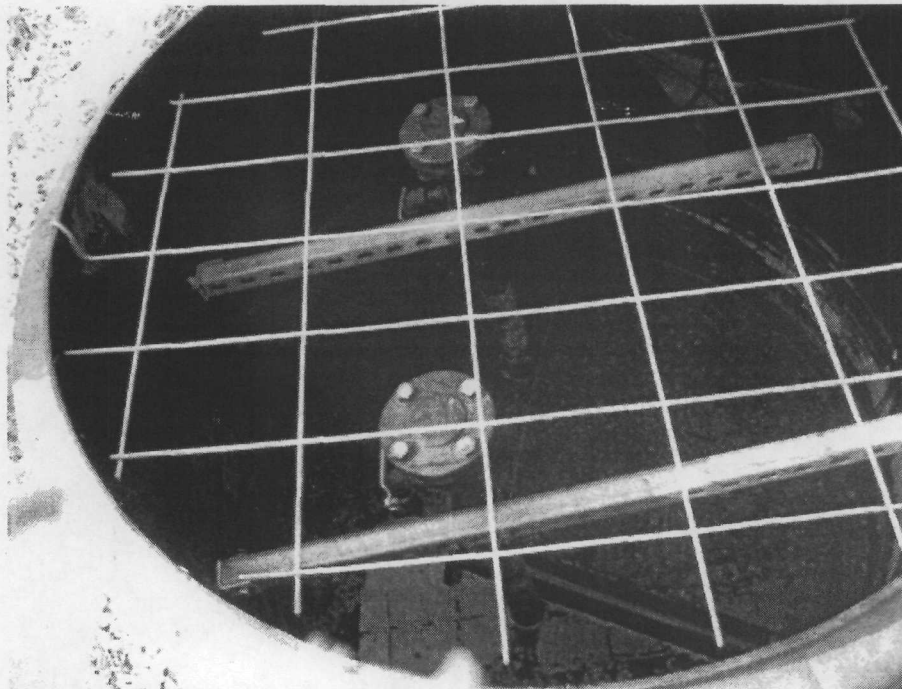


Photograph Description: Discoloration of vegetation near COV 15.

Photograph #10

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Approximately 2 feet of water in COV 15 with scum and a pipe spool piece floating on top.

FIELD PHOTOGRAPH LOG

Photograph #11

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Tire ruts from equipment in the area east of south landfill.

Photograph #12

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Water draining from Toe Drain Outfall A.

FIELD PHOTOGRAPH LOG

Photograph #13

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

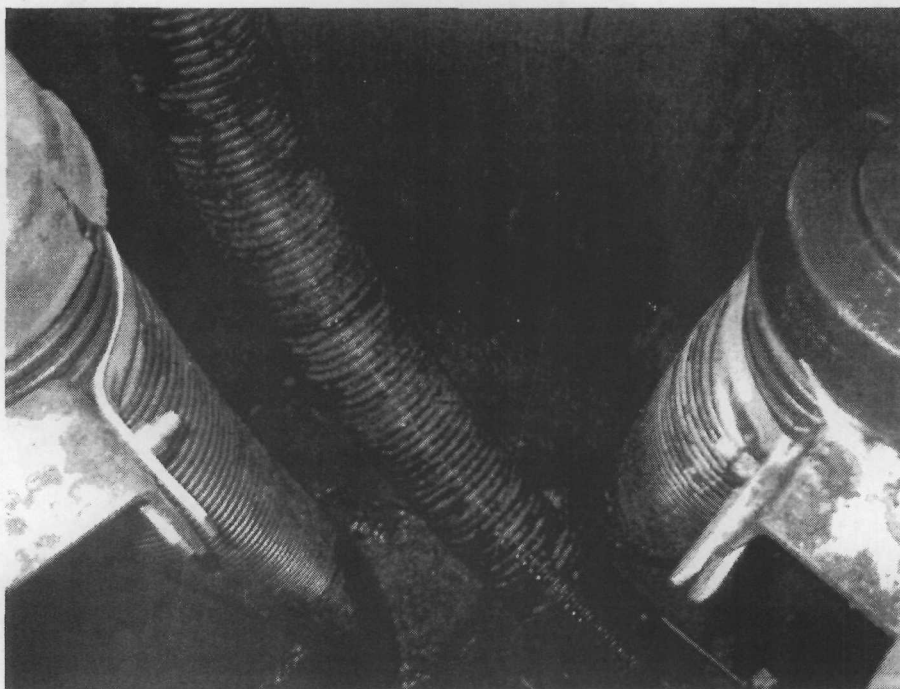


Photograph Description: The pump controls for EG-307.

Photograph #14

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



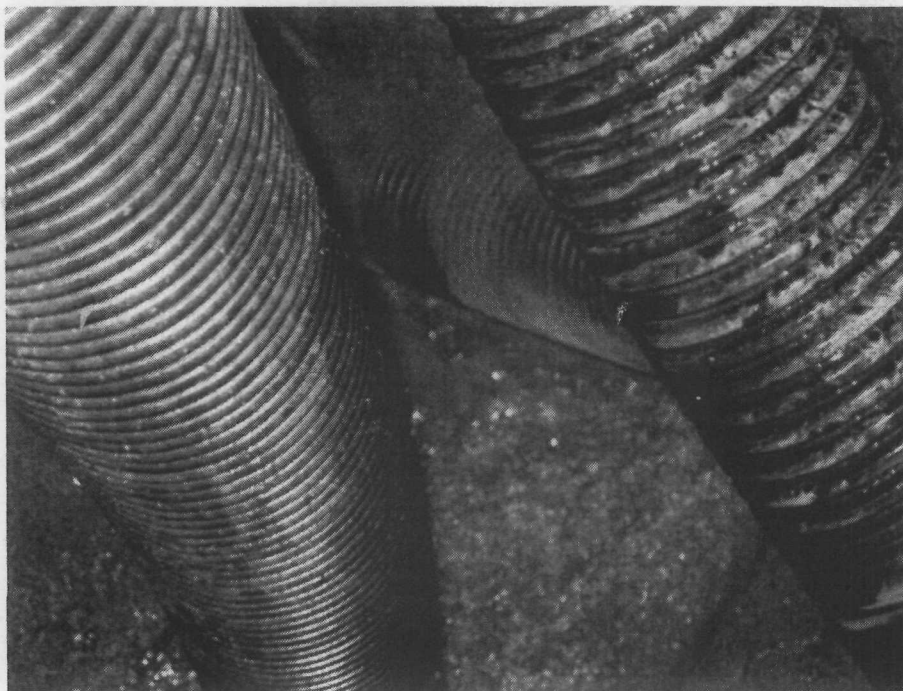
Photograph Description: The interior of the leachate collection manhole located on the South Landfill. Leachate is flowing from the west with a trickle from the north and no flow from the south.

FIELD PHOTOGRAPH LOG

Photograph #15

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

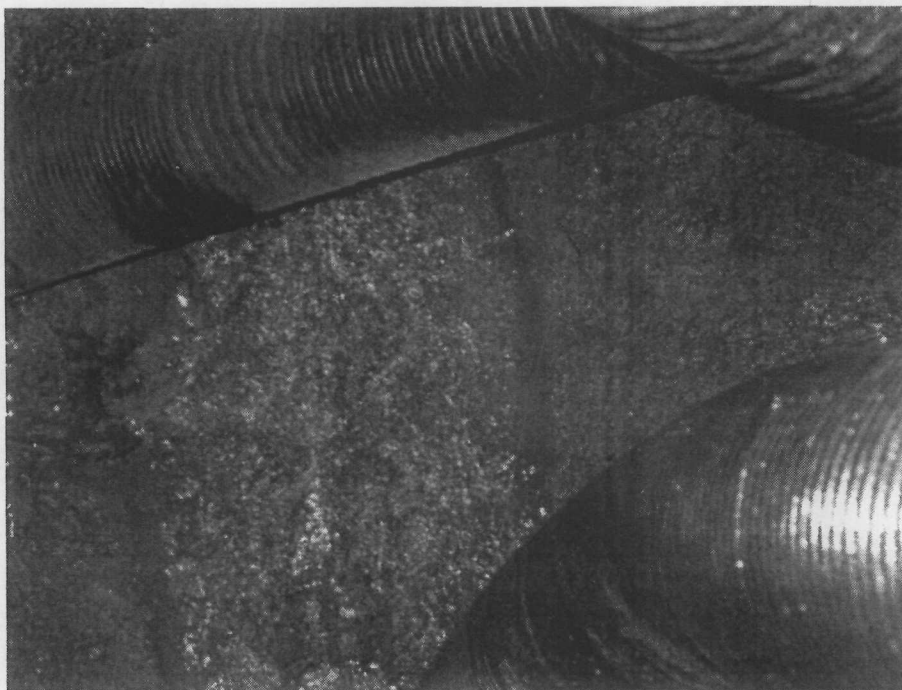


Photograph Description: DELETE

Photograph #16

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



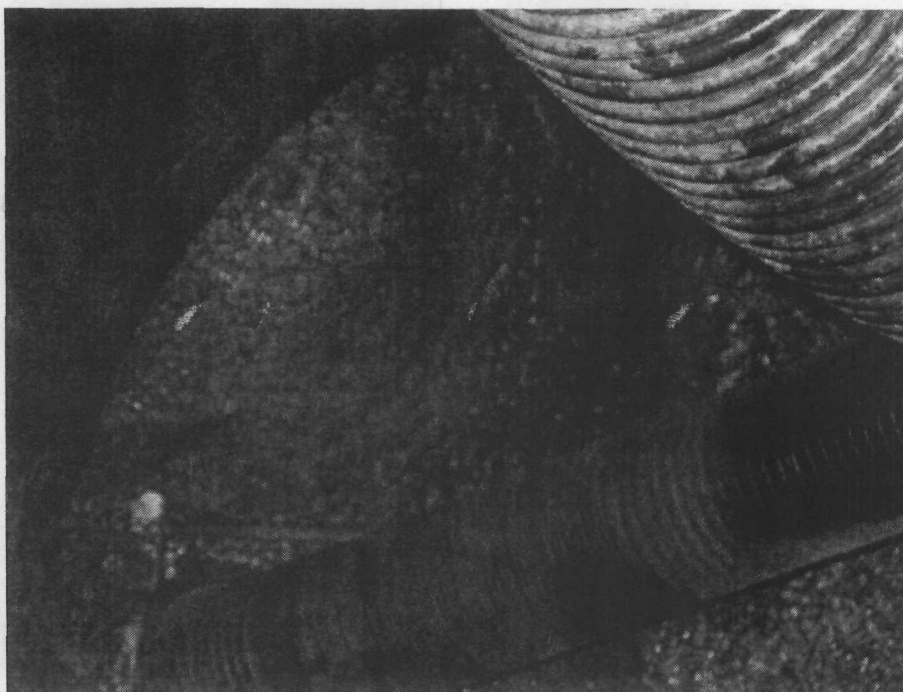
Photograph Description: DELETE

FIELD PHOTOGRAPH LOG

Photograph #17

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: DELETE

Photograph #18

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Area of slight erosion that crosses the South Landfill near Gas Vent 1.

FIELD PHOTOGRAPH LOG

Photograph #19

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

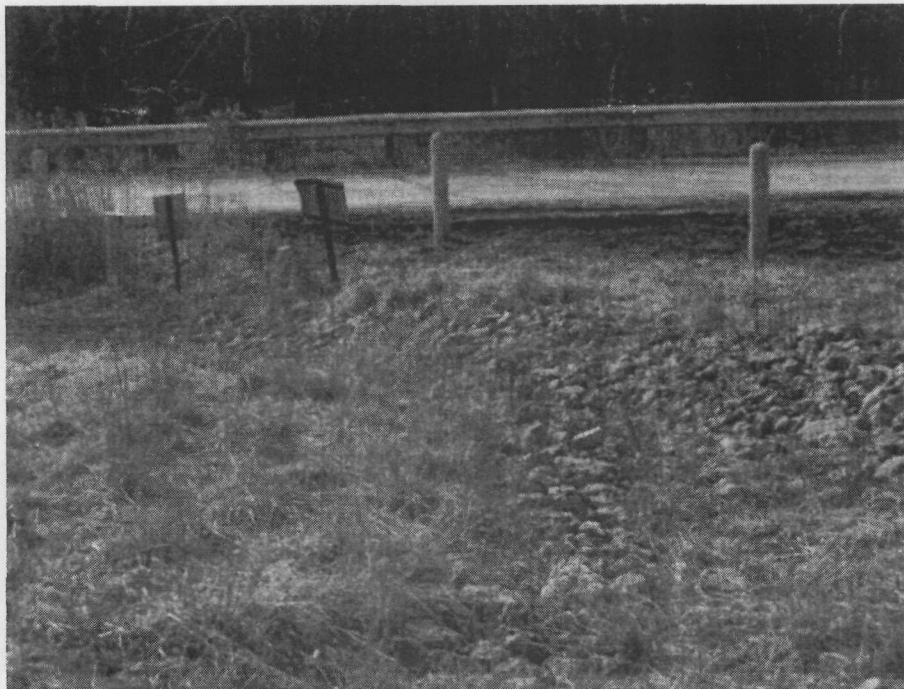


Photograph Description: Area of slight erosion that crosses the South Landfill near Gas Vent 1.

Photograph #20

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: The drainage ditch near monitoring wells MW-45-88 and MW-92-98.

FIELD PHOTOGRAPH LOG

Photograph #21

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Gas Vent 3.

Photograph #22

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Piezometer PZ-17 observed without the required lock.

FIELD PHOTOGRAPH LOG

Photograph #23

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

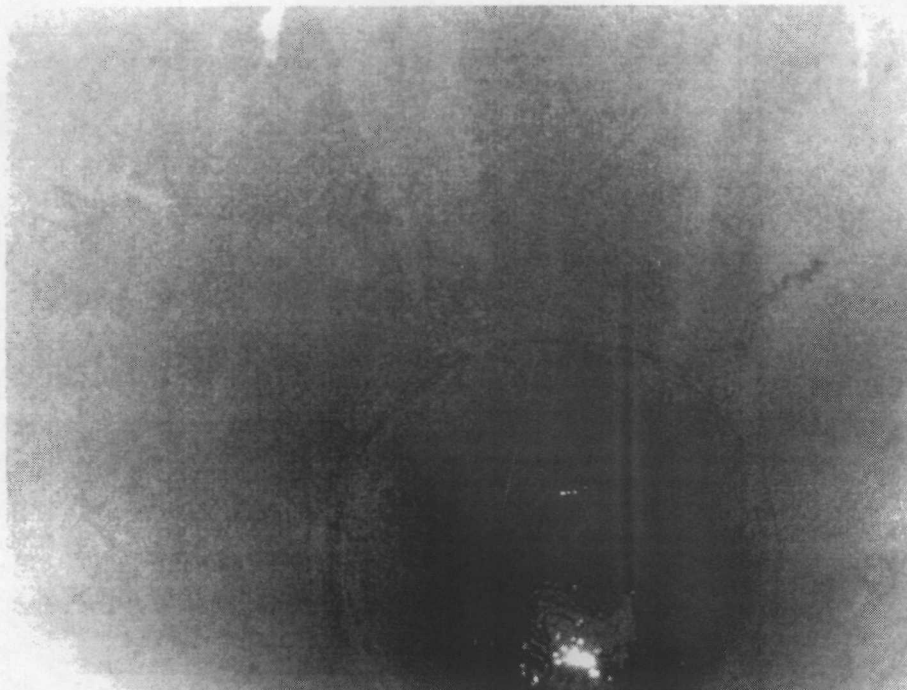


Photograph Description: The interior of the flush mounted deep leachate collection system manhole for the South Landfill with a small amount of liquid in the bottom.

Photograph #24

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



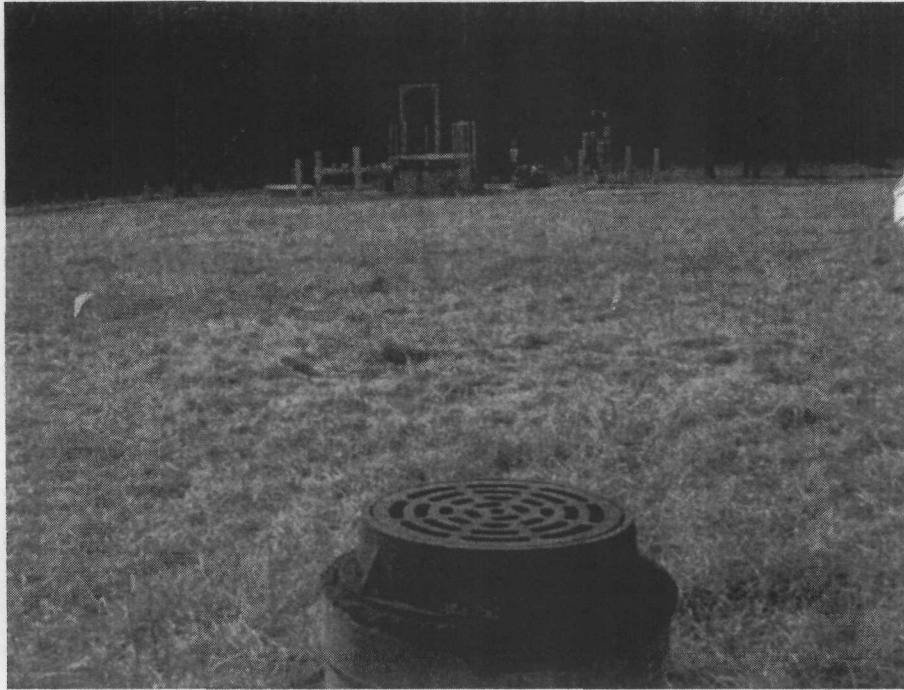
Photograph Description: The interior of the deep leachate collection system manhole for the South Landfill with flow from the north.

FIELD PHOTOGRAPH LOG

Photograph #25

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Exterior of the deep collection manhole shown in Photograph #24.

Photograph #26

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



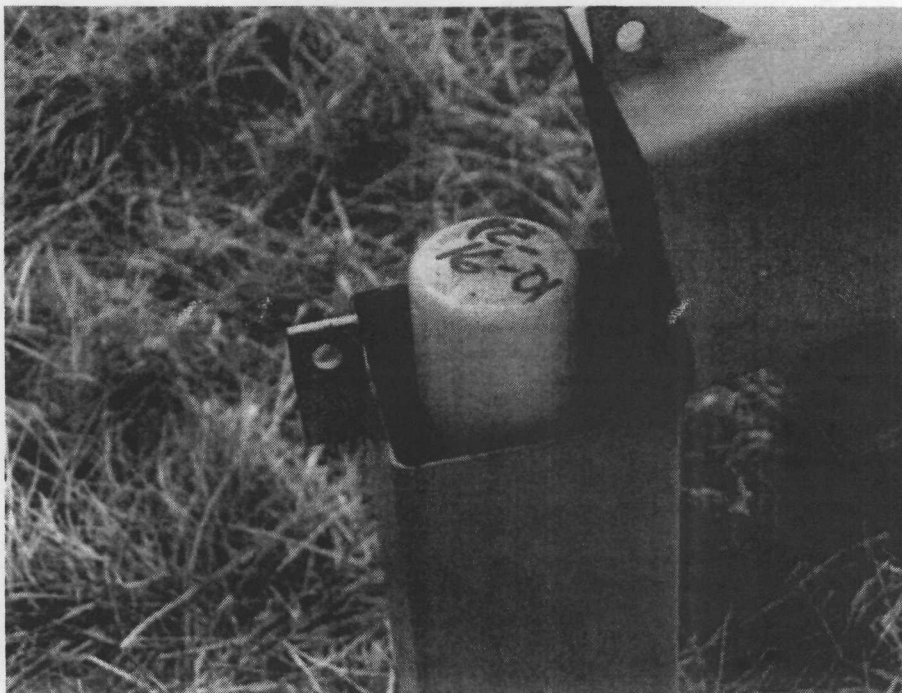
Photograph Description: Exterior of the deep collection manhole shown in Photograph #23.

FIELD PHOTOGRAPH LOG

Photograph #27

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Piezometer PZ-16 observed without the required lock.

Photograph #28

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Overall condition of the site from the southwest corner of the Quad Pond Area.

FIELD PHOTOGRAPH LOG

Photograph #29

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

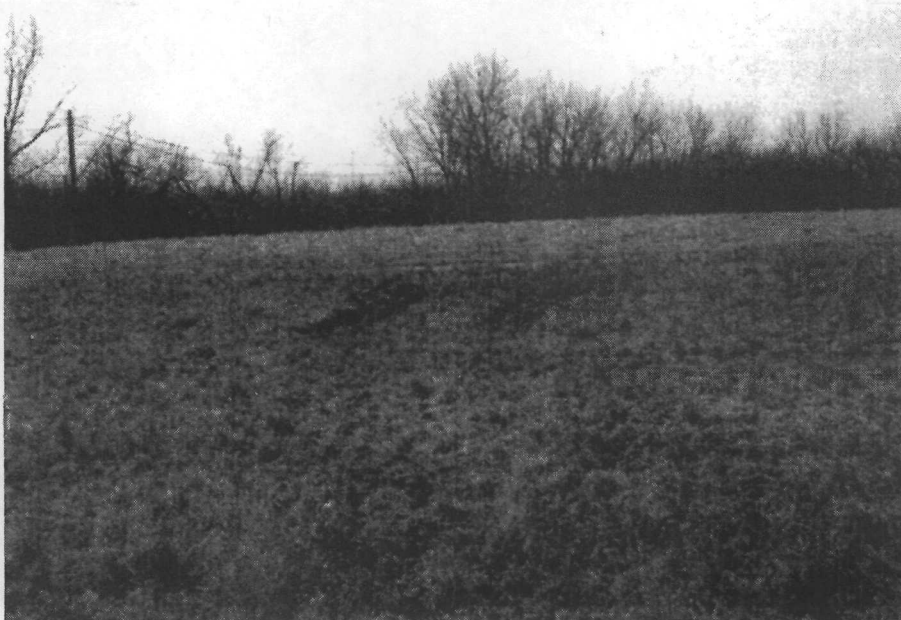


Photograph Description: The overall condition of the groundcover over the entire landfill cap. The groundcover was not cut in the fall so therefore it is overgrown.

Photograph #30

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Tire tracks located on the south end of the North Landfill.

FIELD PHOTOGRAPH LOG

Photograph #31

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

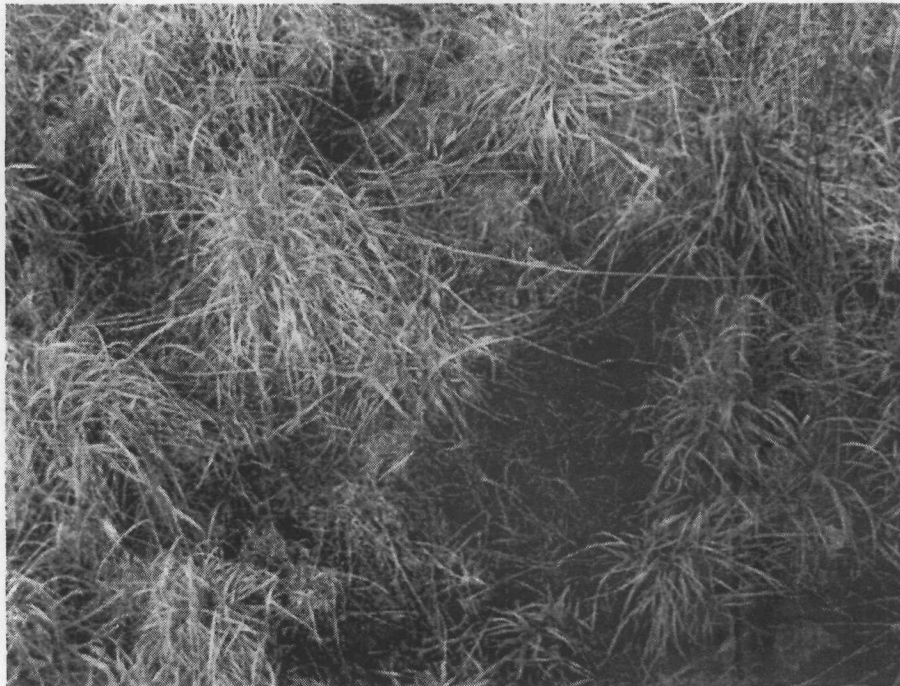


Photograph Description: Piezometer PZ-14 observed without the required lock.

Photograph #32

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



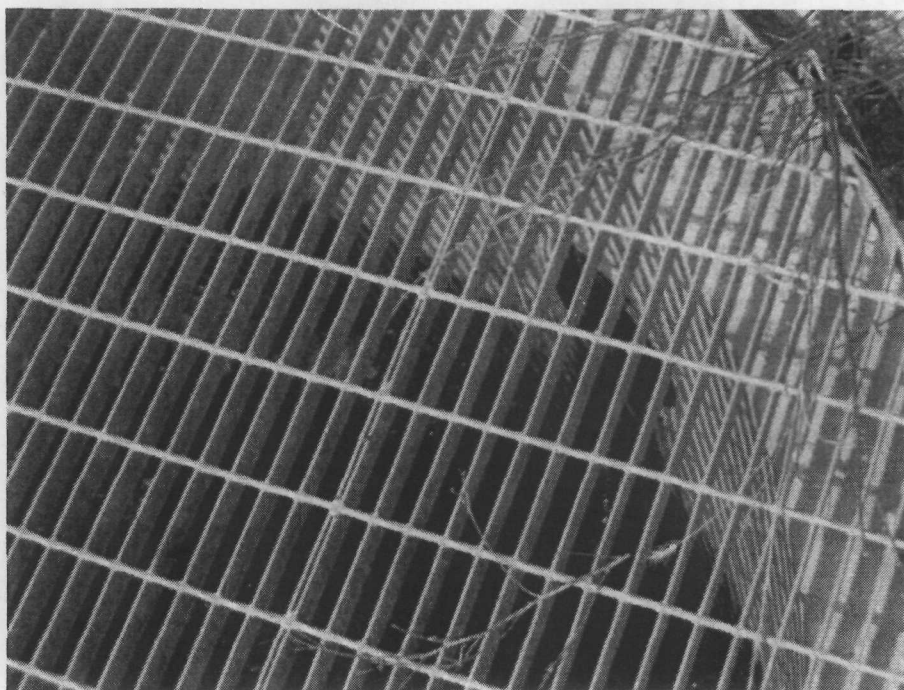
Photograph Description: DELETE

FIELD PHOTOGRAPH LOG

Photograph #33

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: The Triangle Area culvert inlet with flow from Toe Drain C.

Photograph #34

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Piezometer PZ-15 observed without the required lock.

FIELD PHOTOGRAPH LOG

Photograph #35

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: DELETE

Photograph #36

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: DELETE

FIELD PHOTOGRAPH LOG

Photograph #37

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: An area of patchy grass observed on the northeast corner of the North Landfill.

Photograph #38

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: The north slope of the North Landfill cap. The picture was taken facing east on the north landfill road.

FIELD PHOTOGRAPH LOG

Photograph #39

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: DELETE

Photograph #40

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



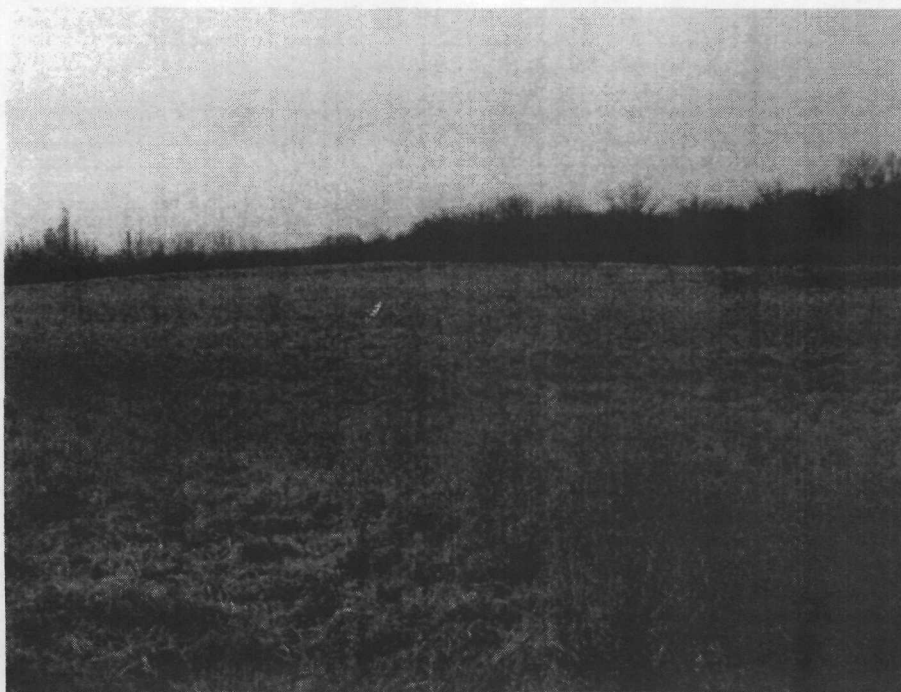
Photograph Description: The northern portion of the Quad Pond Area from the northwest corner of the North Landfill.

FIELD PHOTOGRAPH LOG

Photograph #41

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: The southern portion of the Quad Pond Area from the northwest corner of the North Landfill.

Photograph #42

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Deer tracks running across the North Landfill through the Quad Pond Area.

FIELD PHOTOGRAPH LOG

Photograph #43

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

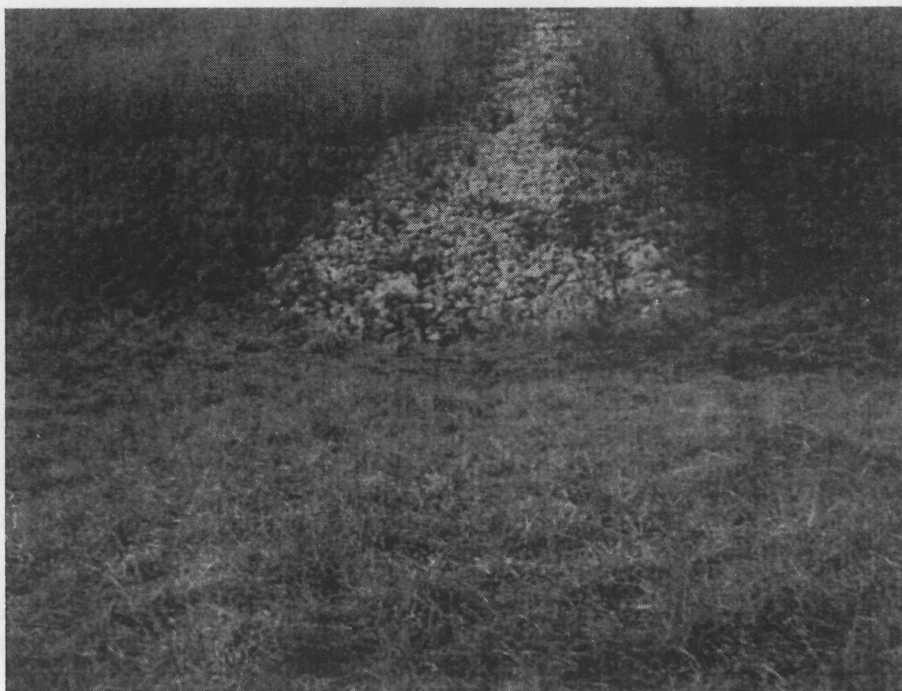


Photograph Description: Deer tracks running across the top of the North Landfill from the Quad Pond Area.

Photograph #44

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Toe Drain Outlet E.

FIELD PHOTOGRAPH LOG

Photograph #45

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

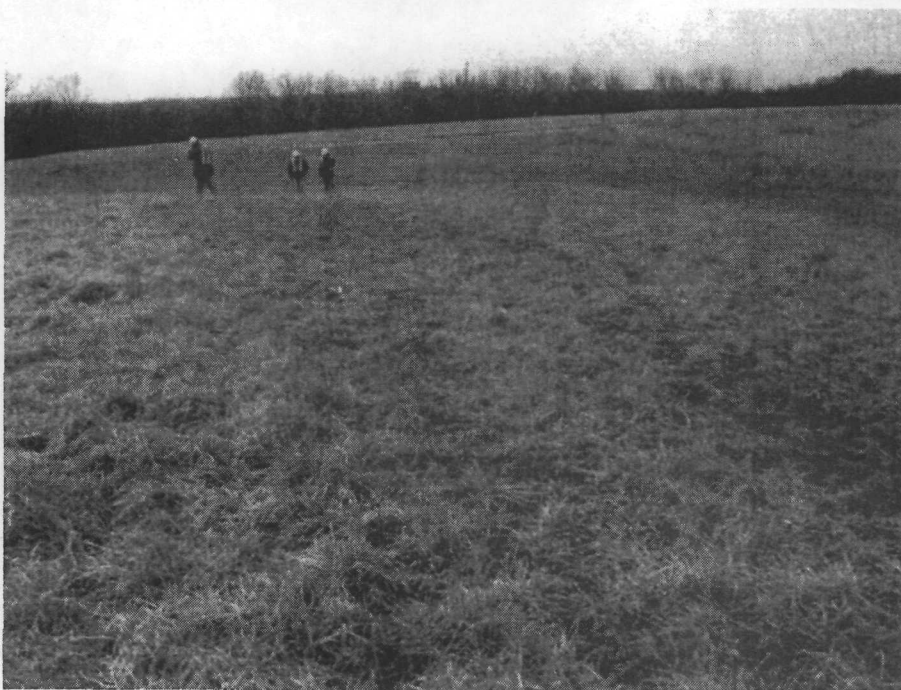


Photograph Description: Water flowing from Toe Drain Outlet E.

Photograph #46

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



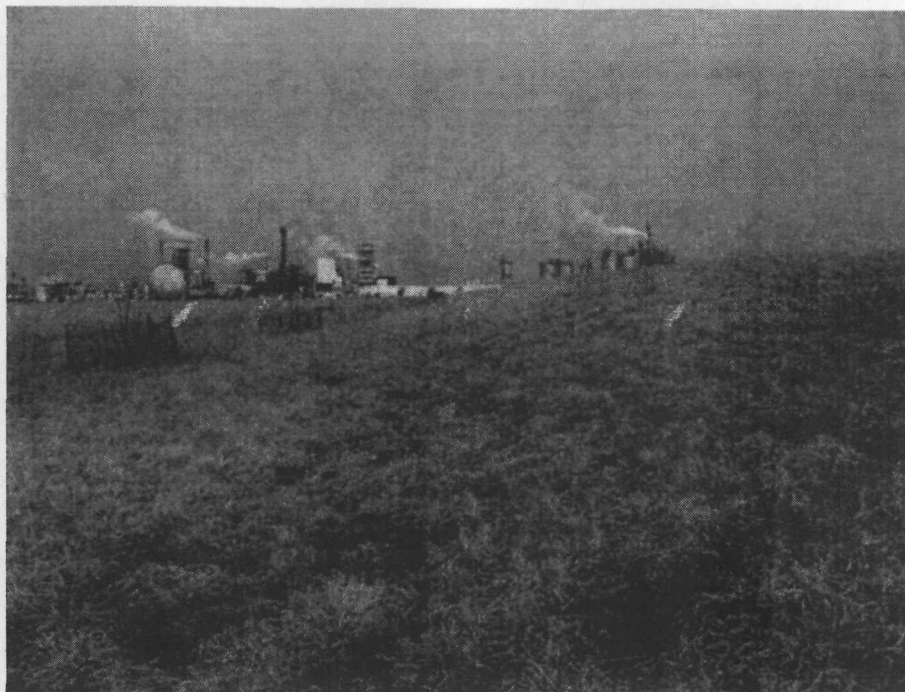
Photograph Description: Area of patchy grass located on the southwest corner of the North Landfill.

FIELD PHOTOGRAPH LOG

Photograph #47

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: West side slope of the North Landfill from the southwest corner of the landfill.

Photograph #48

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



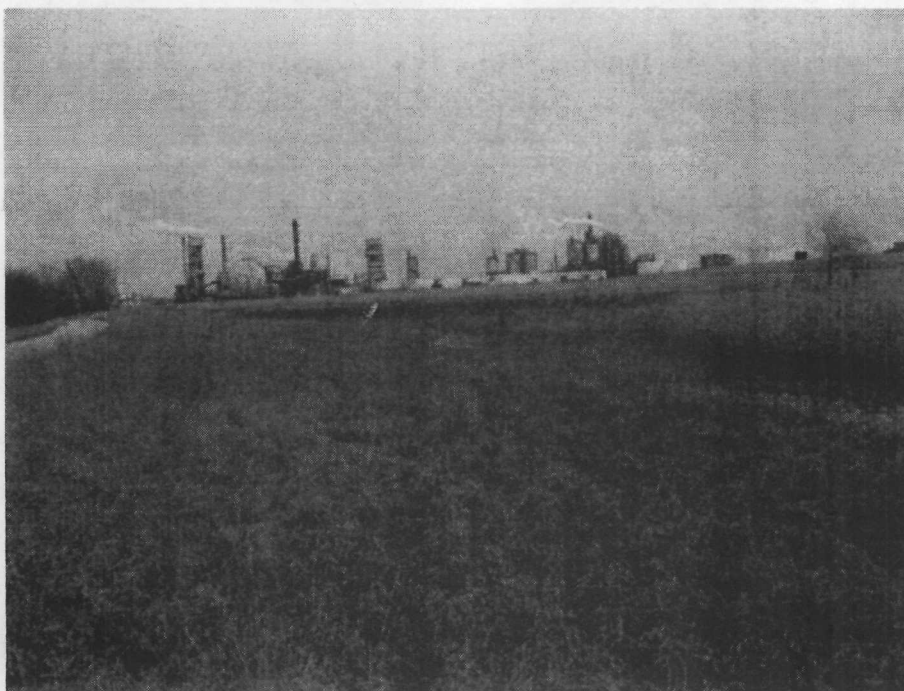
Photograph Description: South side slope of the North Landfill from the southwest corner of the landfill.

FIELD PHOTOGRAPH LOG

Photograph #49

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Ponding in the middle of the Quad Pond Area.

Photograph #50

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Seep located south of monitoring well MW-112-02

FIELD PHOTOGRAPH LOG

Photograph #51

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Staining of water and rocks from seep located south of monitoring well MW-113-02.

Photograph #52

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Extent of staining in the drainage ditch near seep located south of monitoring well MW-113-02.

FIELD PHOTOGRAPH LOG

Photograph #53

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

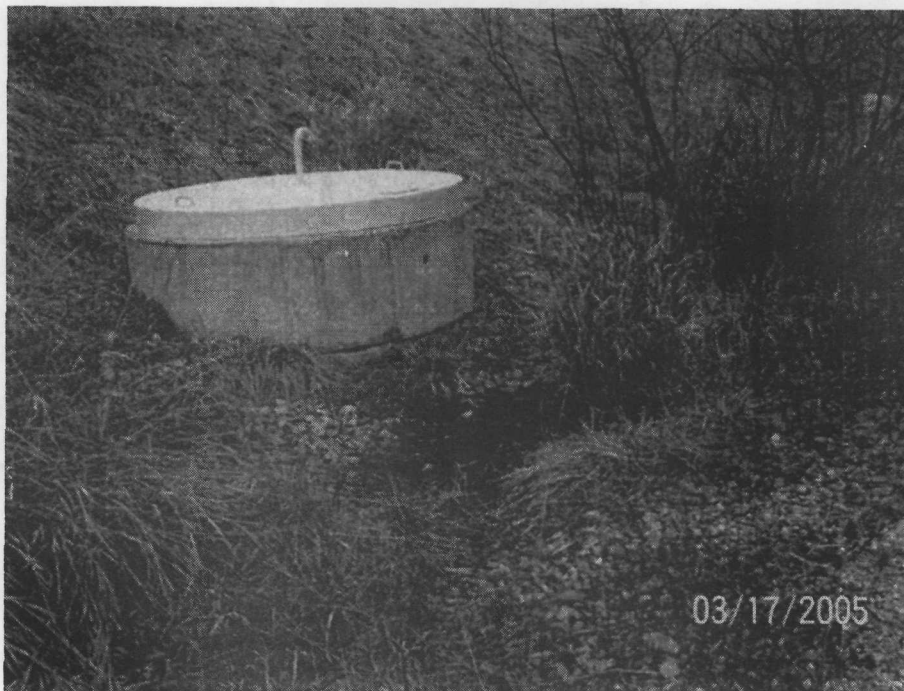


Photograph Description: Staining in the drainage ditch located north of the road located on the Groundwater Interceptor Trench (GWIT).

Photograph #54

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Seep located near manhole located south of piezometer PZ-5-98.

FIELD PHOTOGRAPH LOG

Photograph #55

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Staining in drainage ditch to the south of piezometer PZ-5-98.

Photograph #56

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Staining in drainage ditch to the south of piezometer PZ-5-98.

FIELD PHOTOGRAPH LOG

Photograph #57

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Staining in drainage ditch near piezometer PZ-5-98.

Photograph #58

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Staining in drainage ditch near piezometer PZ-5-98.

FIELD PHOTOGRAPH LOG

Photograph #59

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Staining in drainage ditch north of piezometer PZ-5-98.

Photograph #60

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Slight sheen on the discolored water located along the entire drainage ditch west of the lower landfill road.

FIELD PHOTOGRAPH LOG

Photograph #61

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Staining in drainage ditch north of piezometer PZ-5-98.

Photograph #62

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



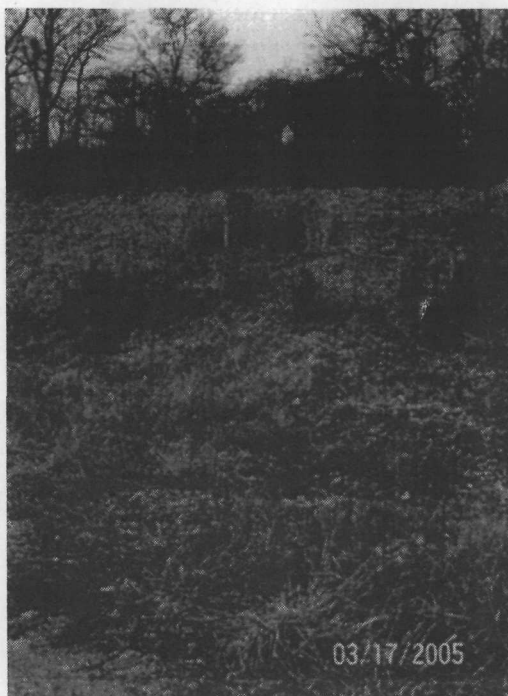
Photograph Description: Extent of staining in drainage ditch north of piezometer PZ-5-98.

FIELD PHOTOGRAPH LOG

Photograph #63

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Extent of staining in drainage ditch north of piezometer PZ-5-98.

Photograph #64

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Extent of staining in drainage ditch north of piezometer PZ-5-98.

FIELD PHOTOGRAPH LOG

Photograph #65

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer

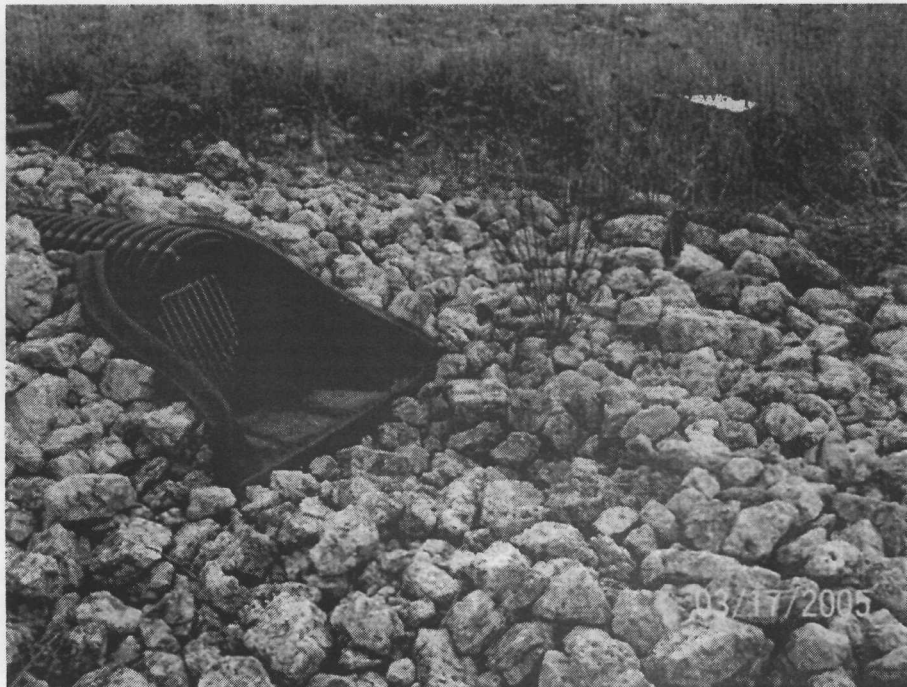


Photograph Description: Discolored liquid flowing in the drainage ditch near the GWIT road.

Photograph #66

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Drainage outlet near MW-96-98 from the Quad Pond Area.

FIELD PHOTOGRAPH LOG

Photograph #67

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Northern portion of the east landfill road and east drainage ditch from the south end of the North Landfill.

Photograph #68

Date of Photograph: 3/17/05

Photographed by: Shawn Shiffer



Photograph Description: Erosion of the east drainage ditch north of piezometer PZ-18-01.

FIELD PHOTOGRAPH LOG

Photograph #69

Date of Photograph: 3/17/05

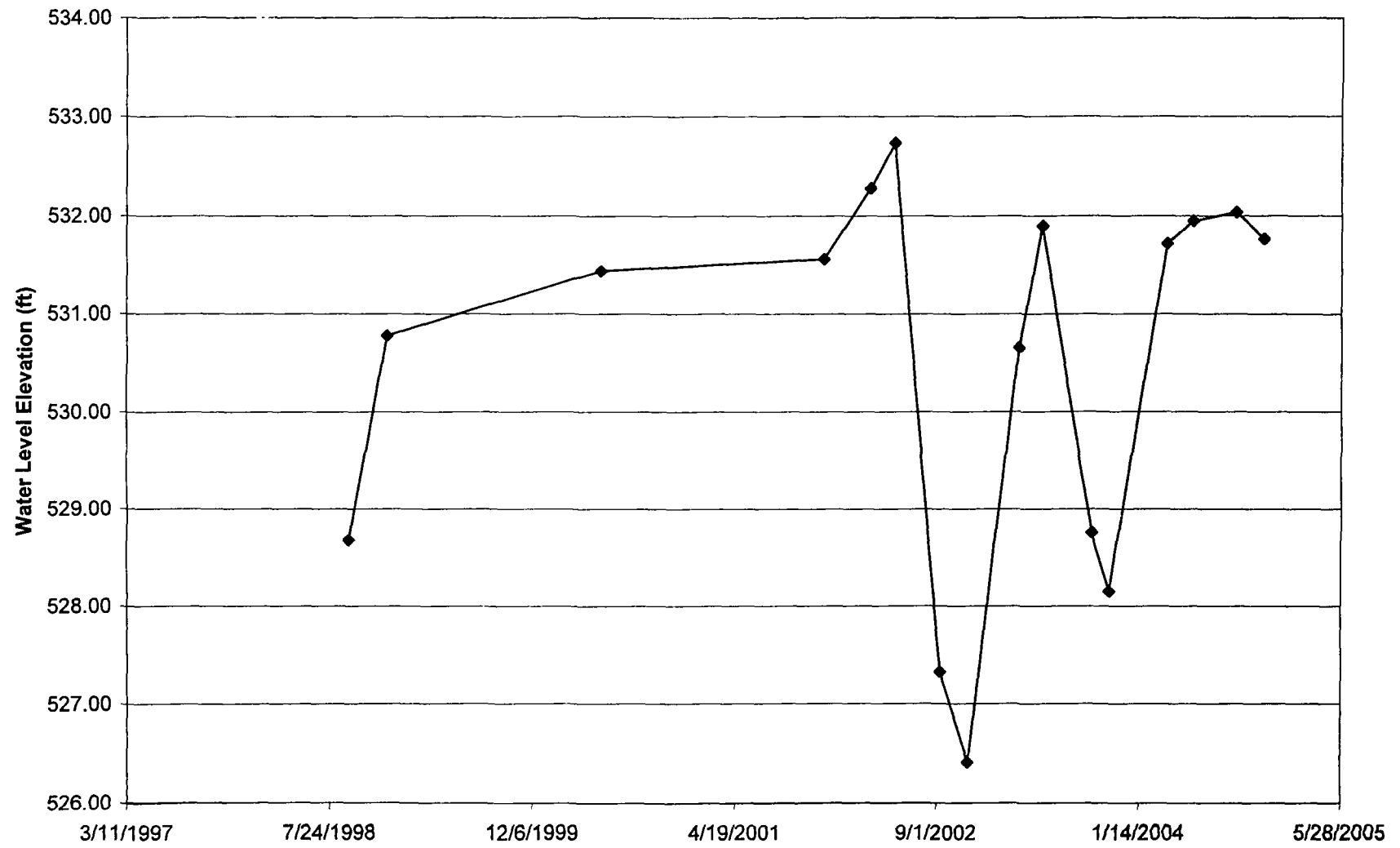
Photographed by: Shawn Shiffer



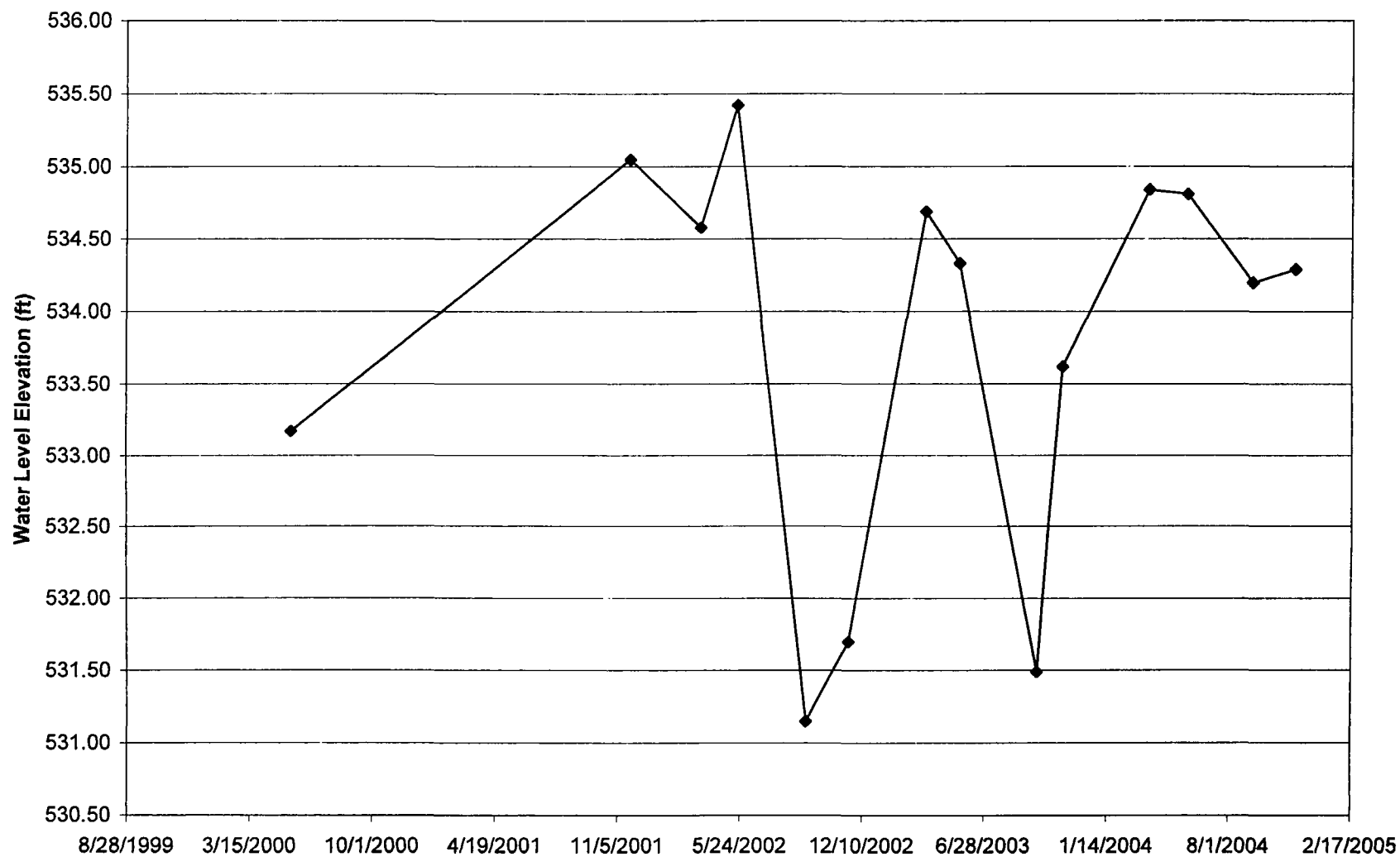
Photograph Description: Southern portion of the east landfill road and east drainage ditch from the south end of the North Landfill.

Appendix A – Water Level Hydrographs

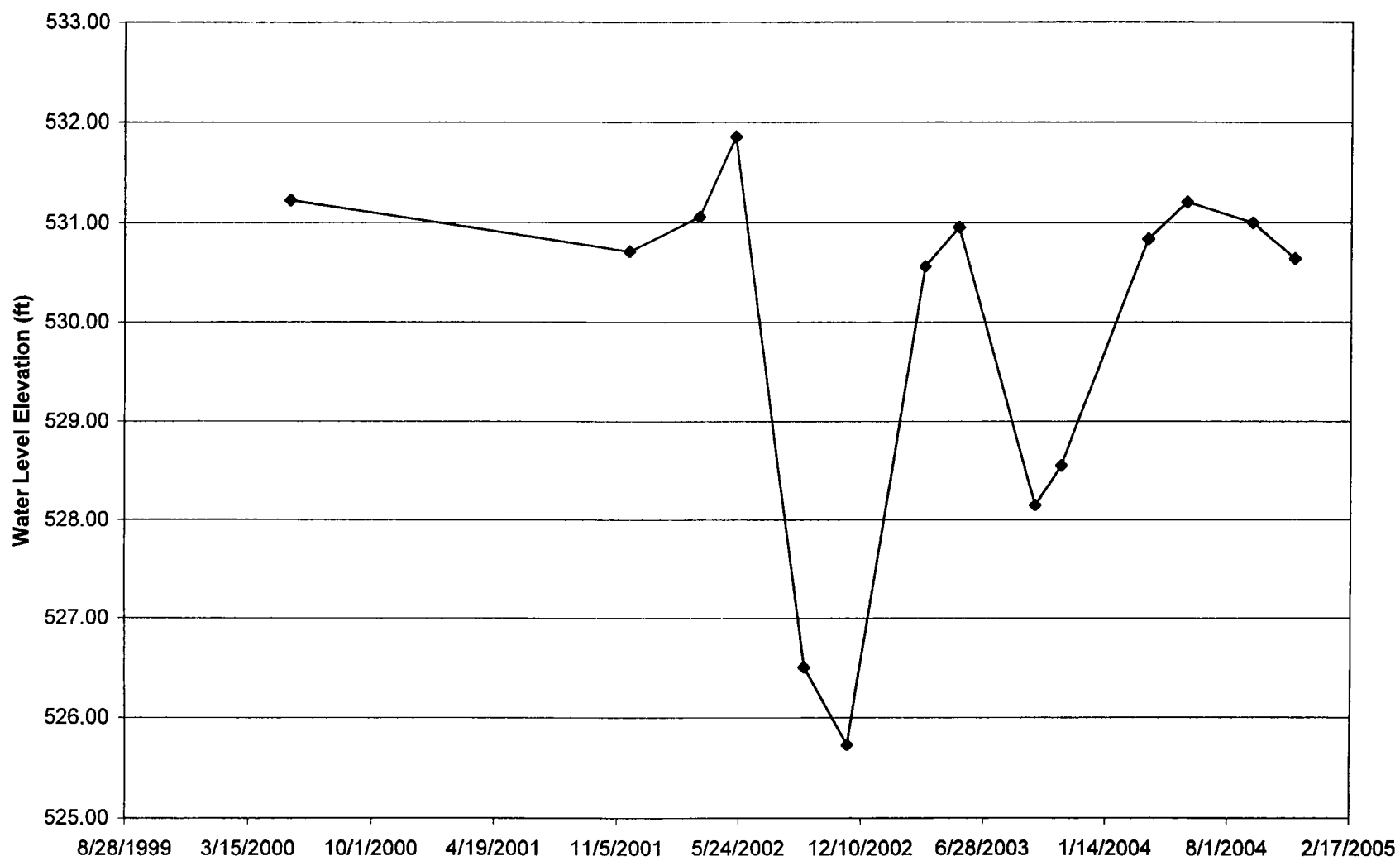
D-3 (HSU2)



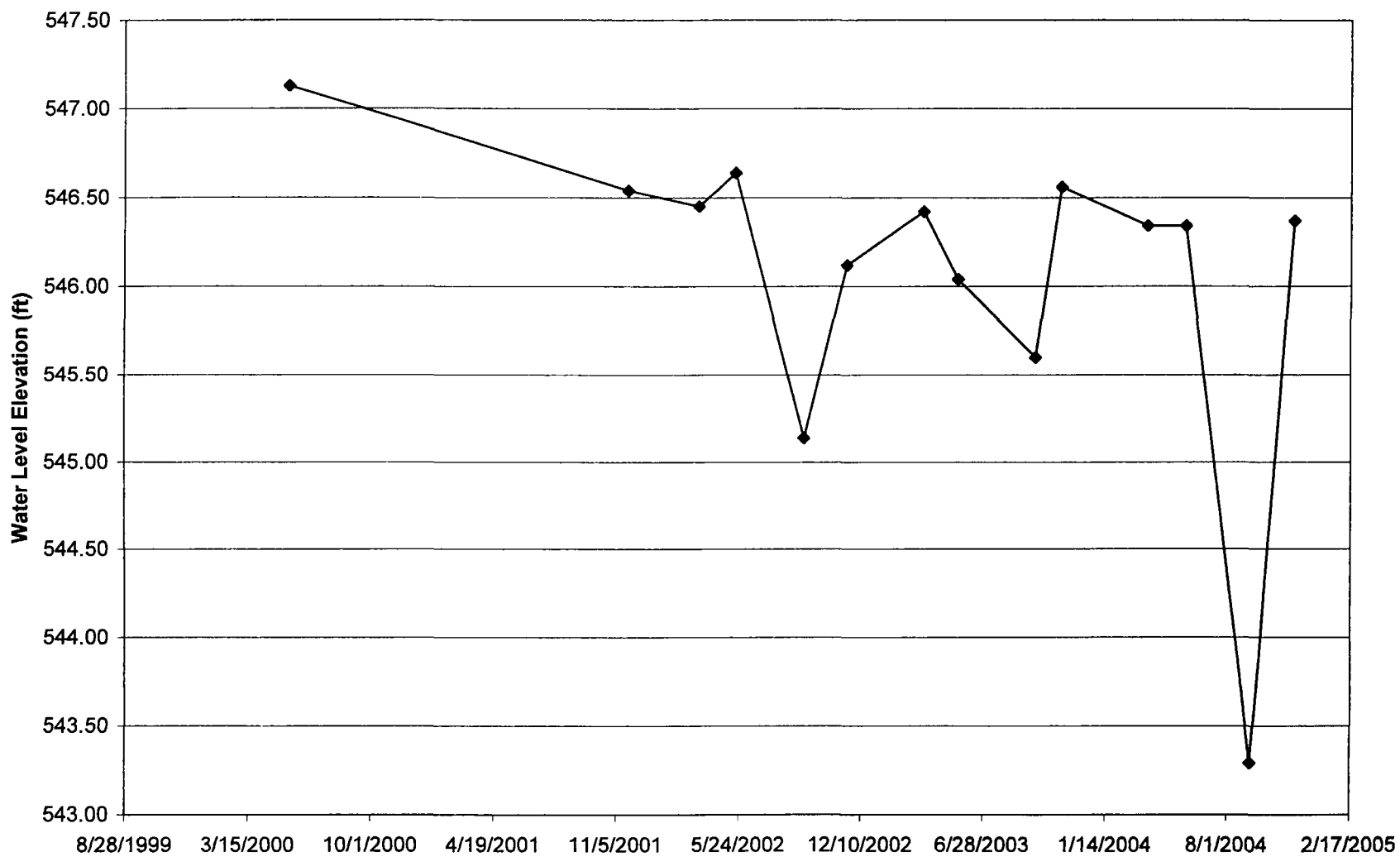
MW-100-99 (HSU2)



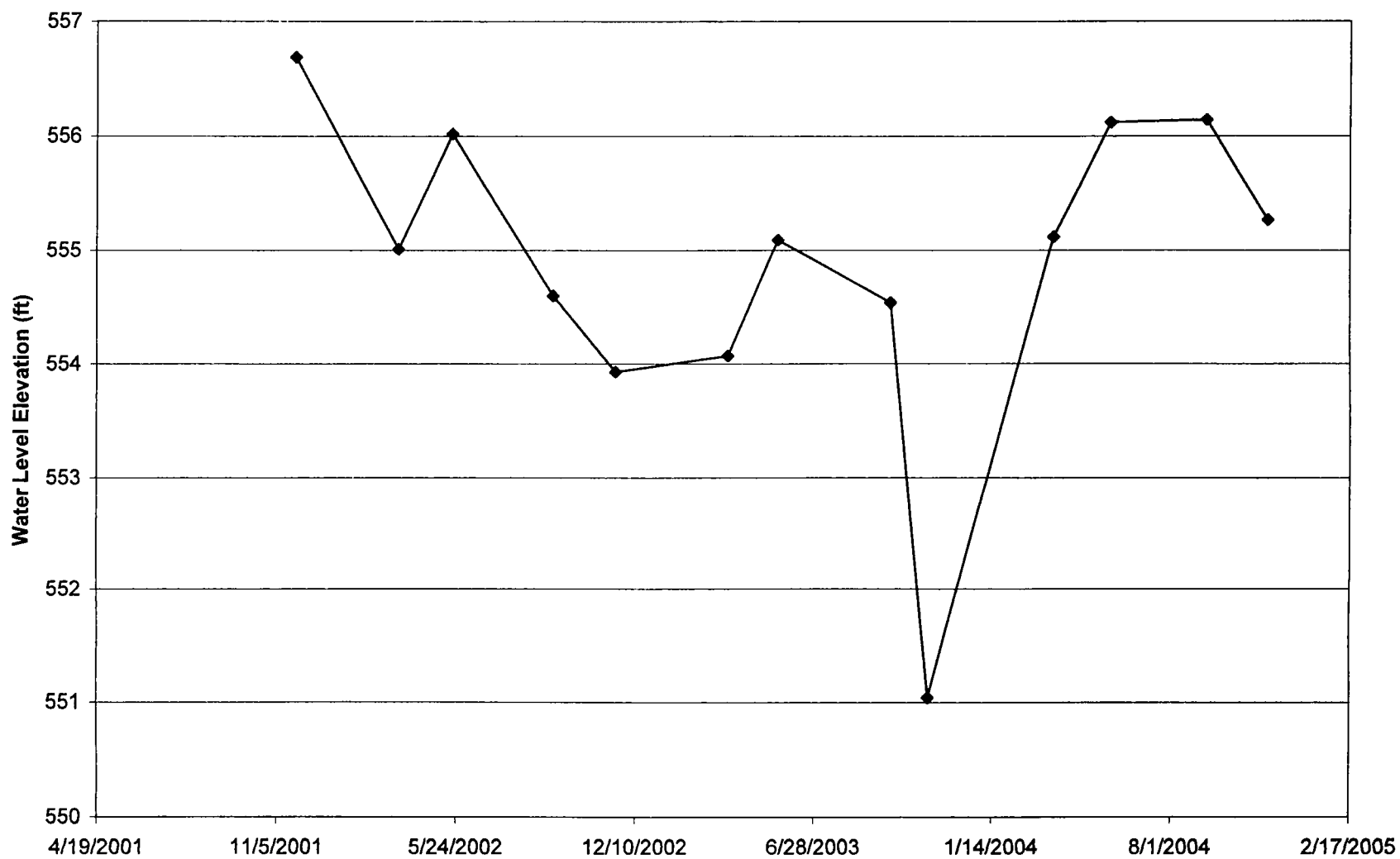
MW-101-99 (HSU2)



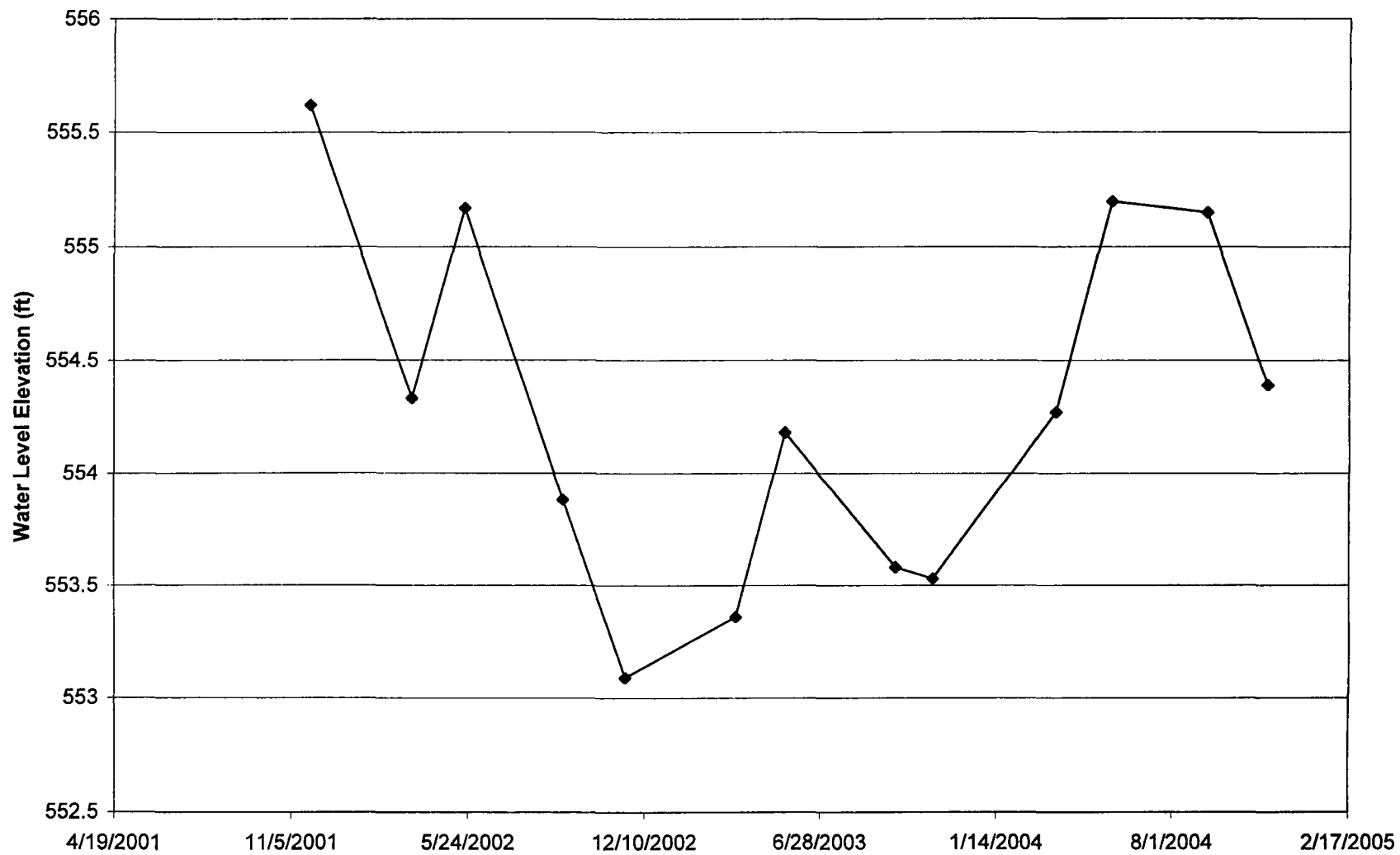
MW-102-99 (HSU2)



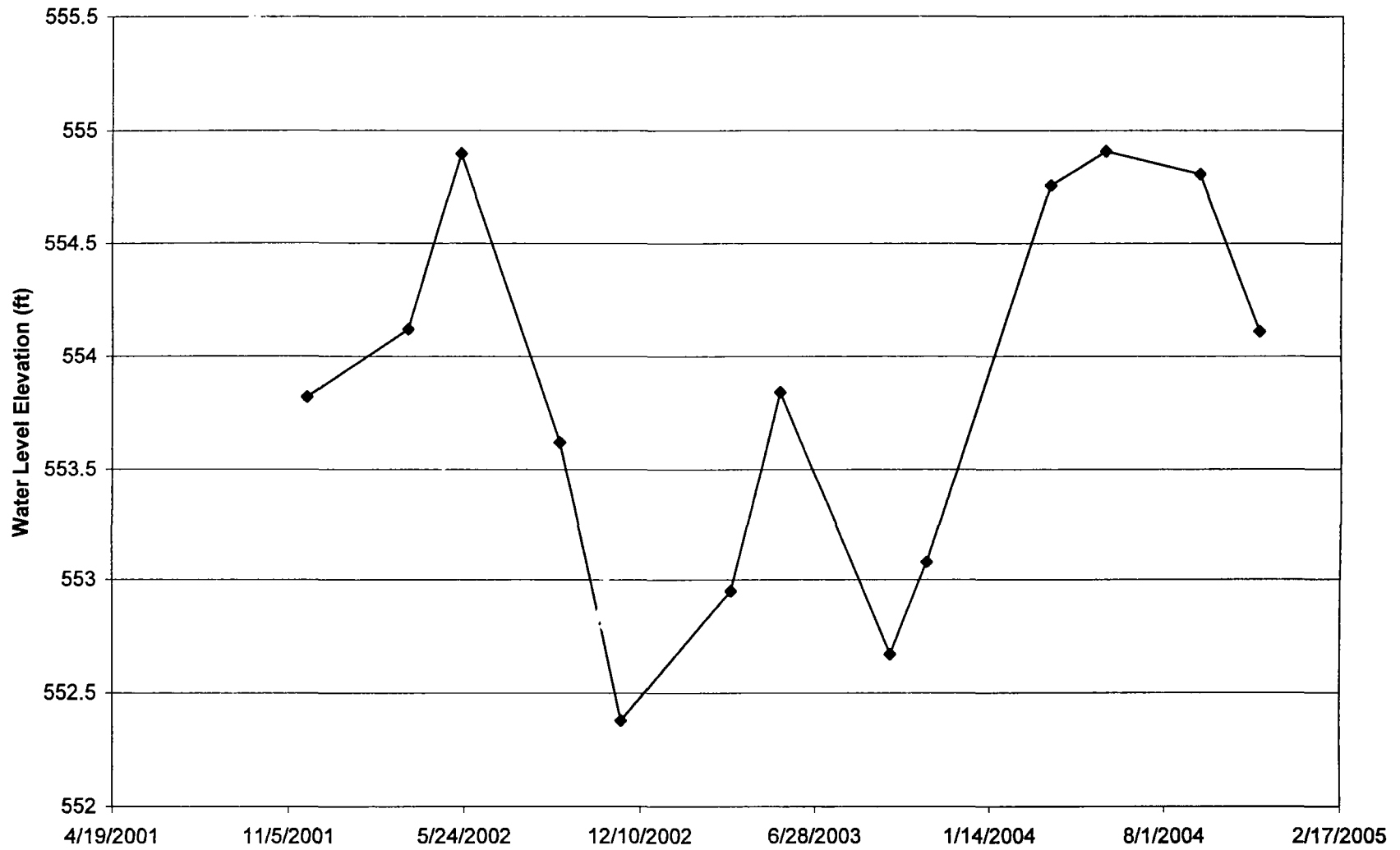
MW-103-01 (HSU1)



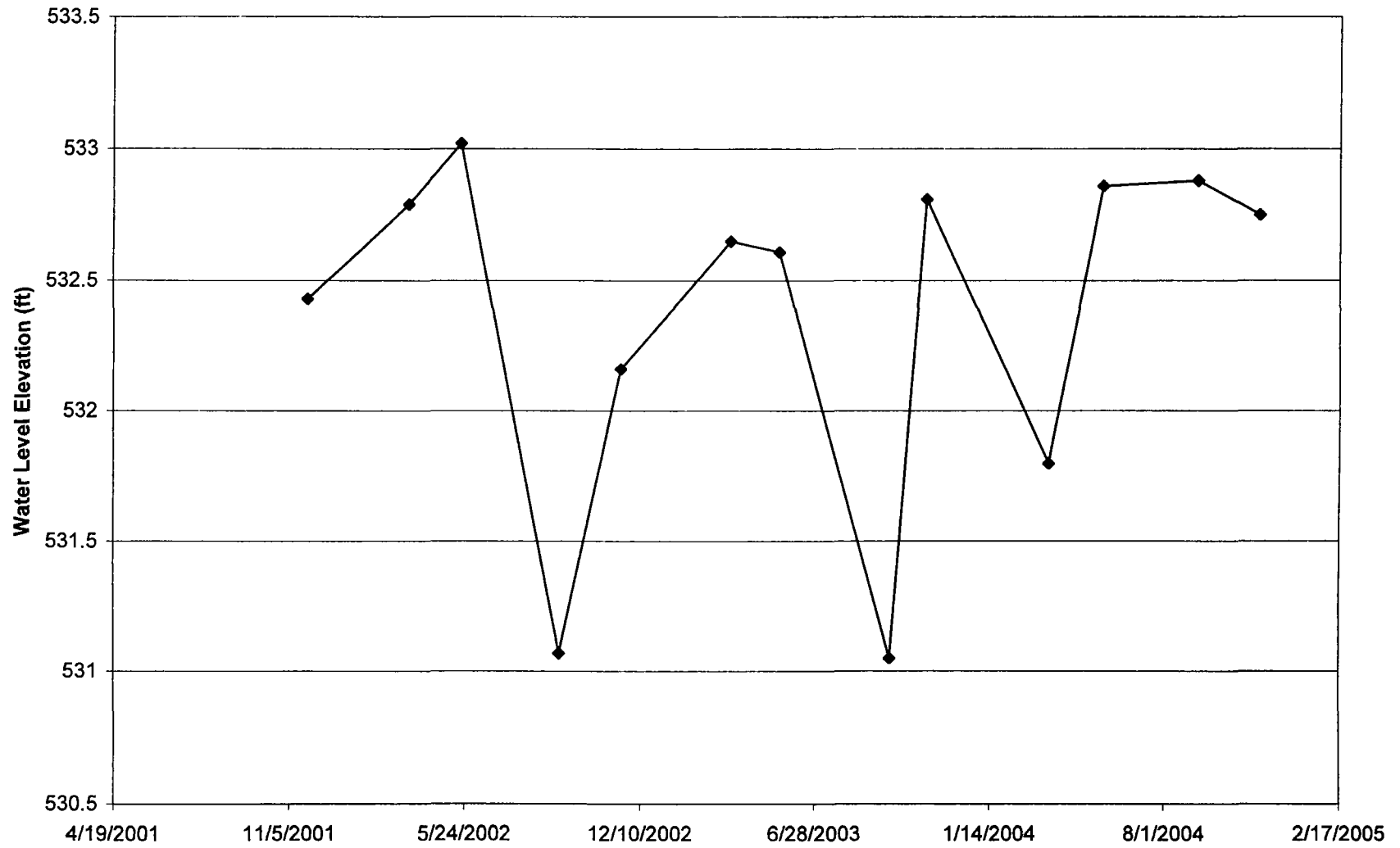
MW-104-01 (HSU1)



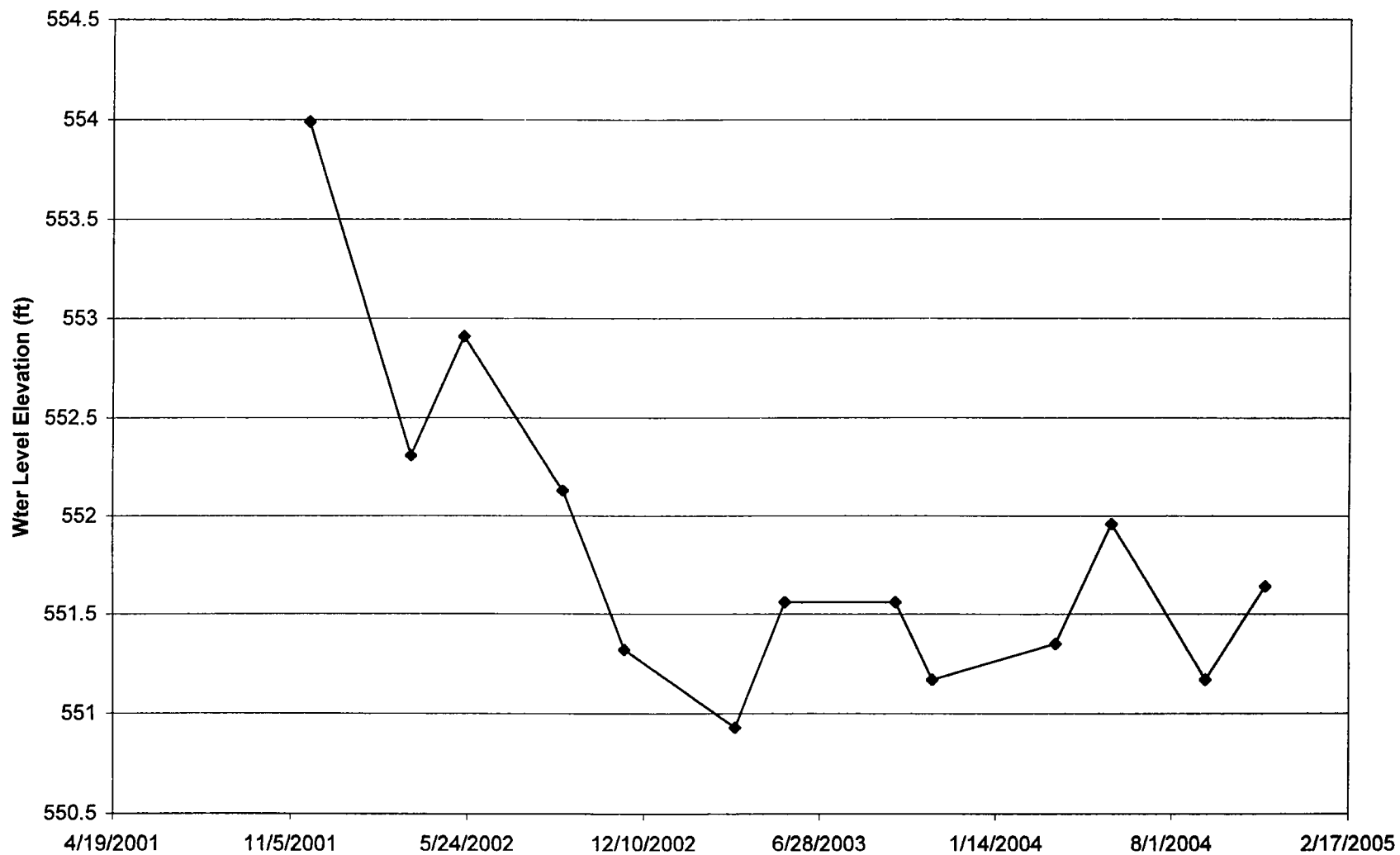
MW-106-01 (HSU1)



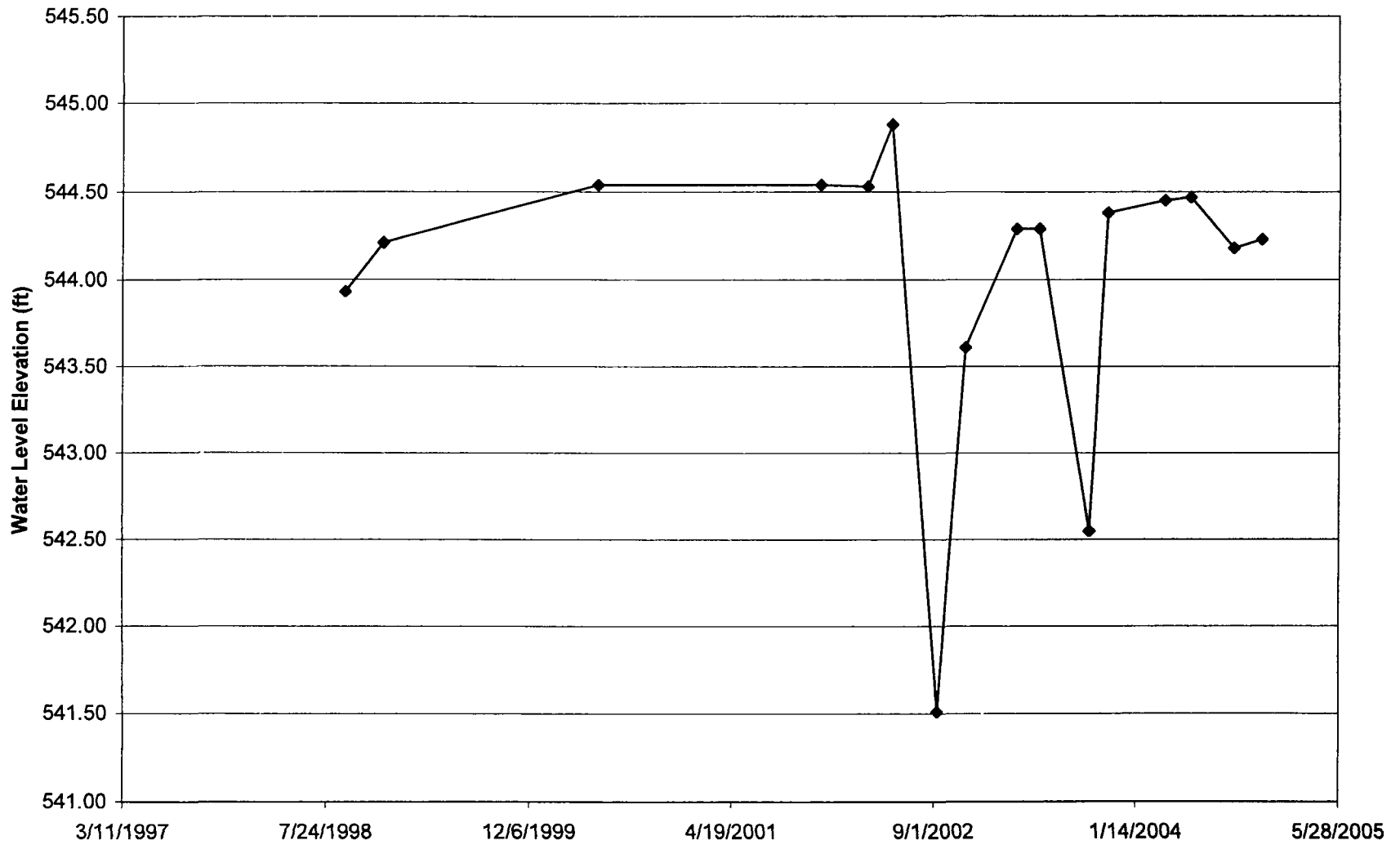
MW-108-01 (HSU1)



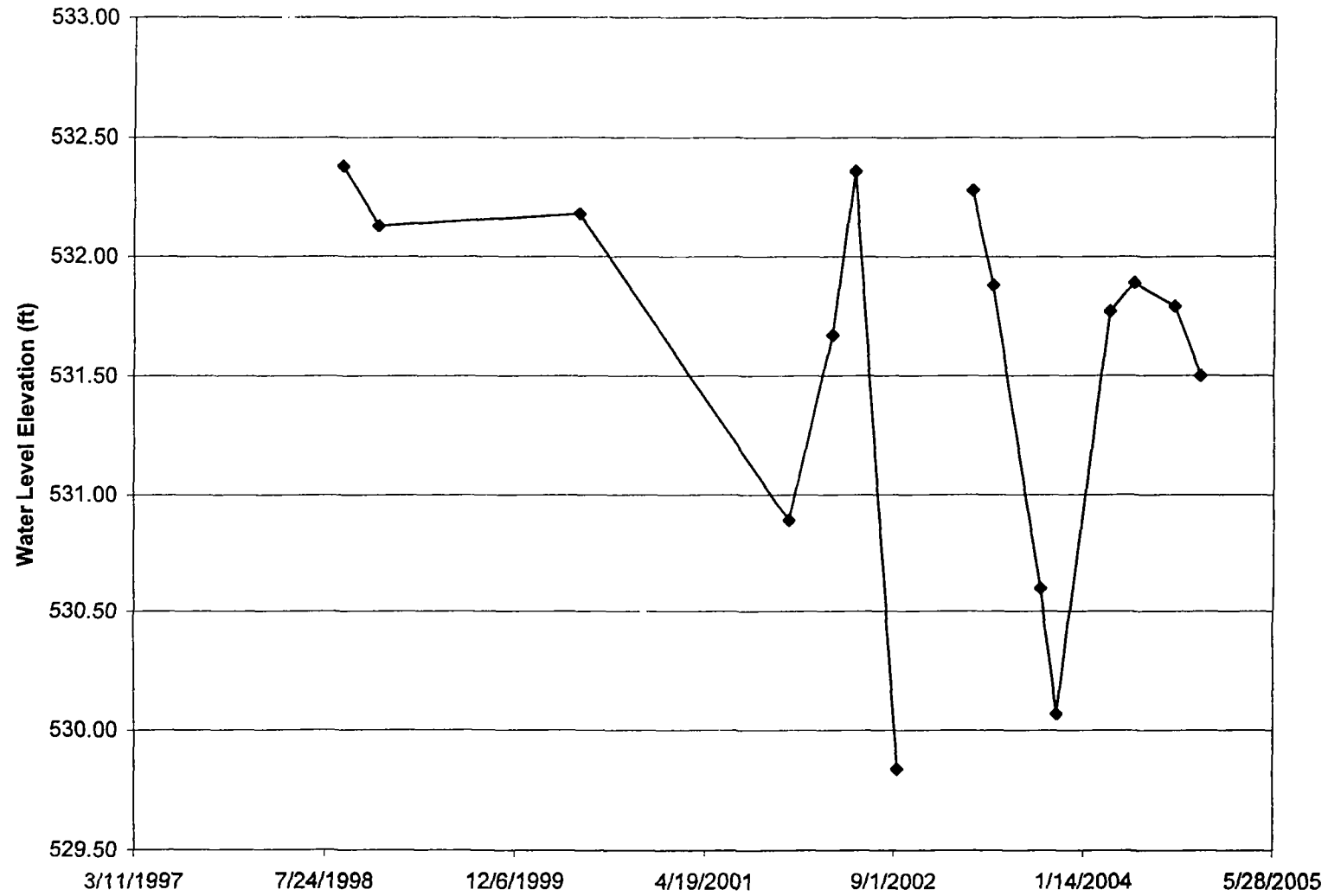
MW-109-01 (HSU1)



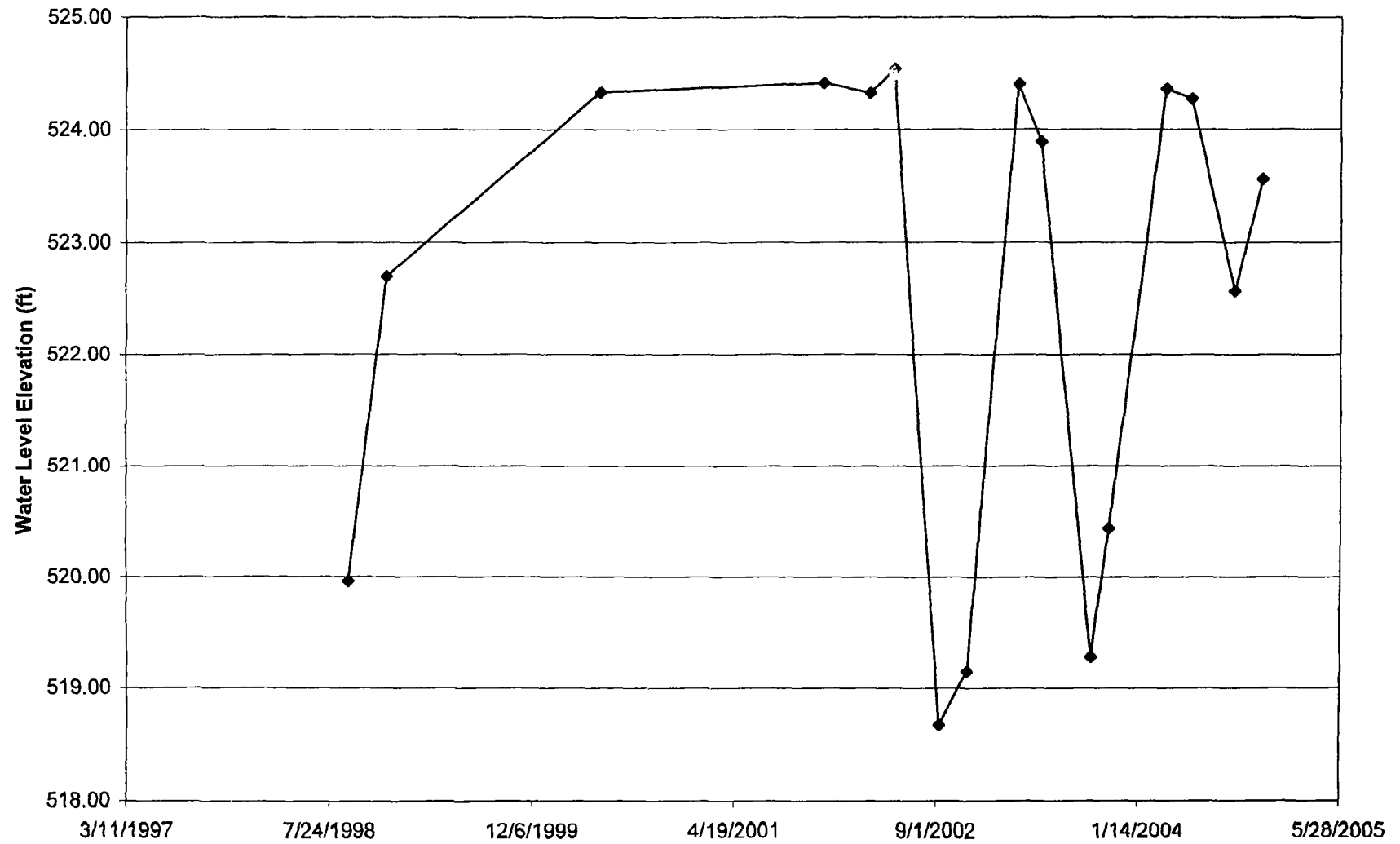
MW-45-88 (Transition Zone)



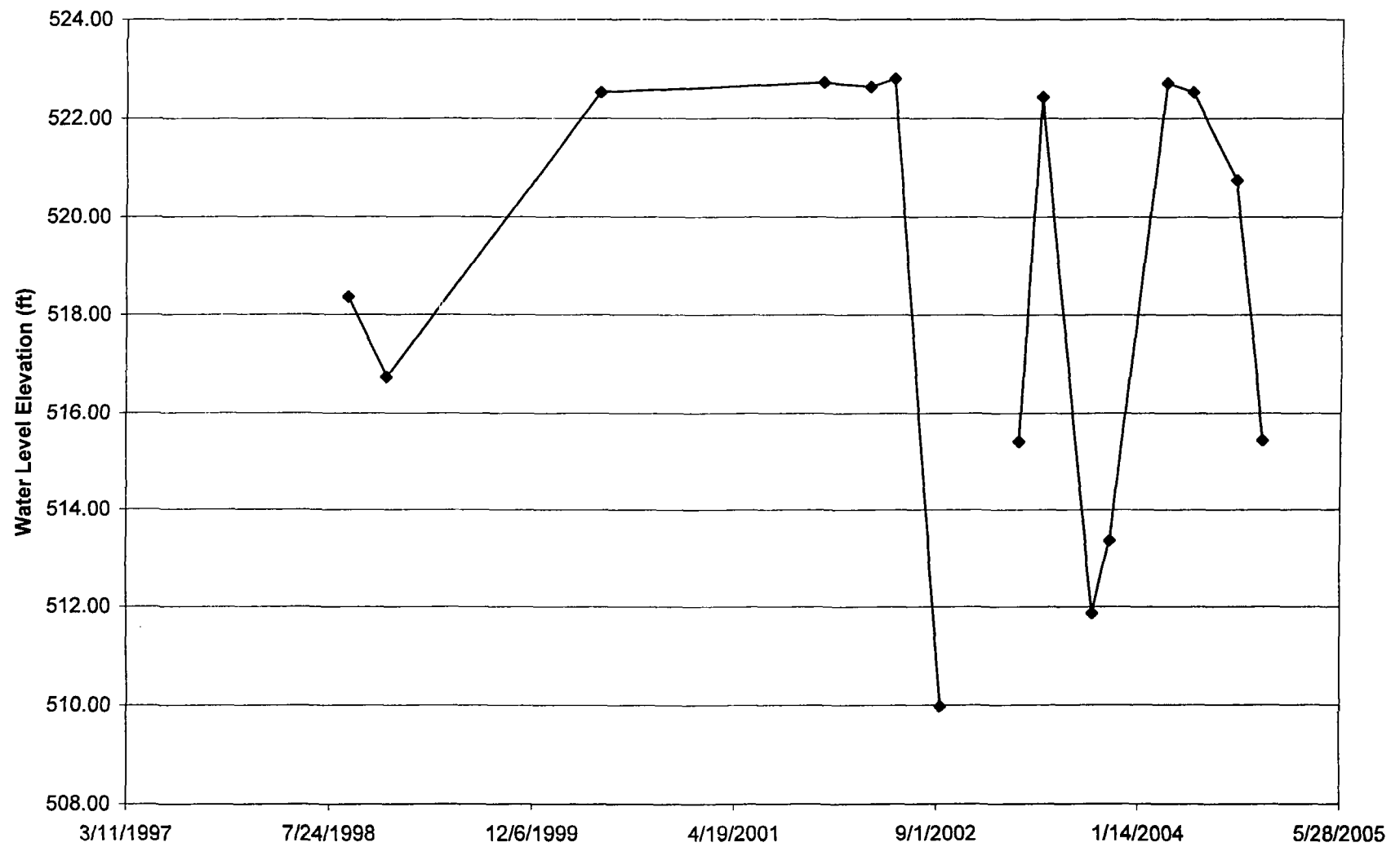
MW-63R-94 (Transition Zone)



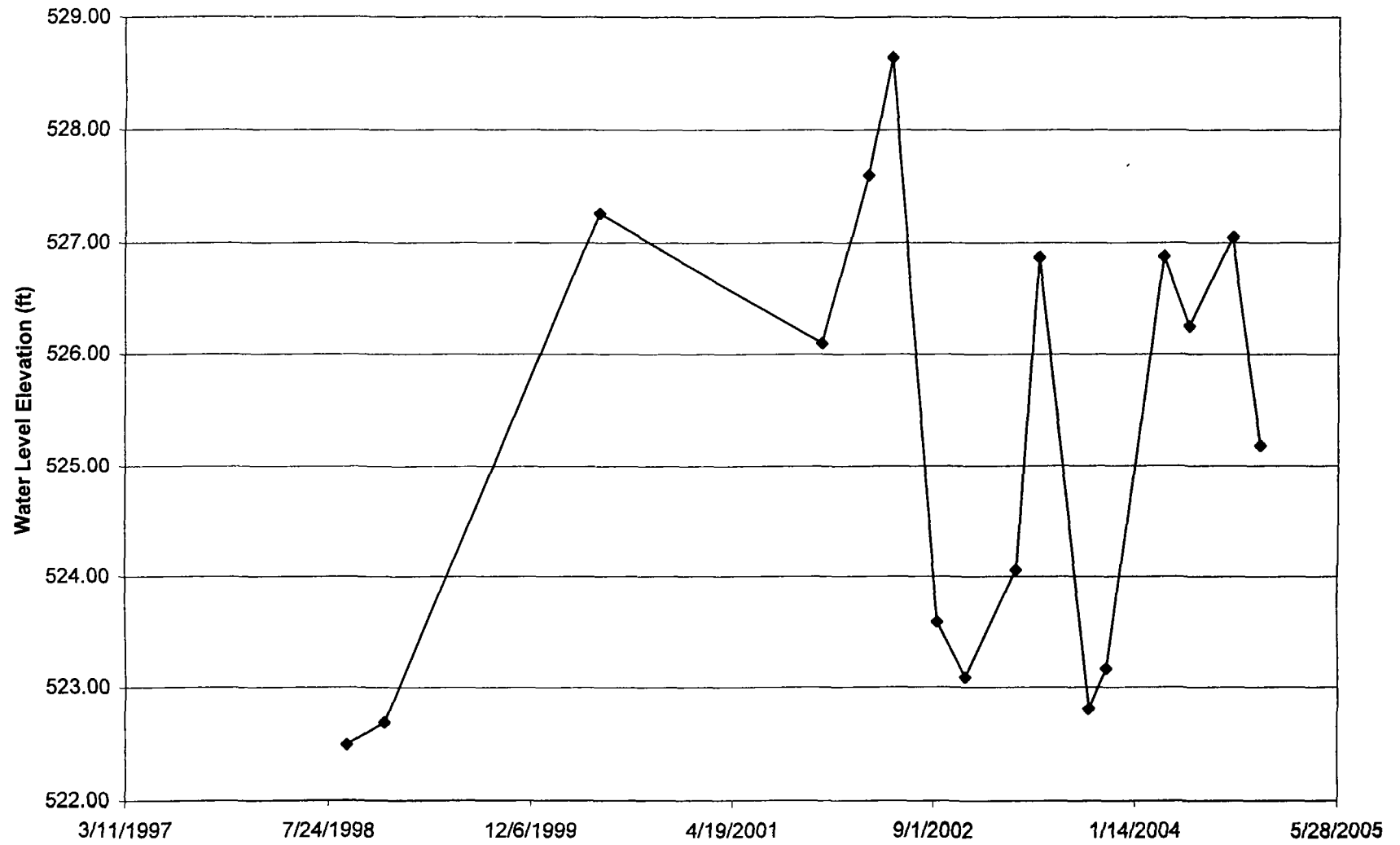
MW-65-89 (HSU2)



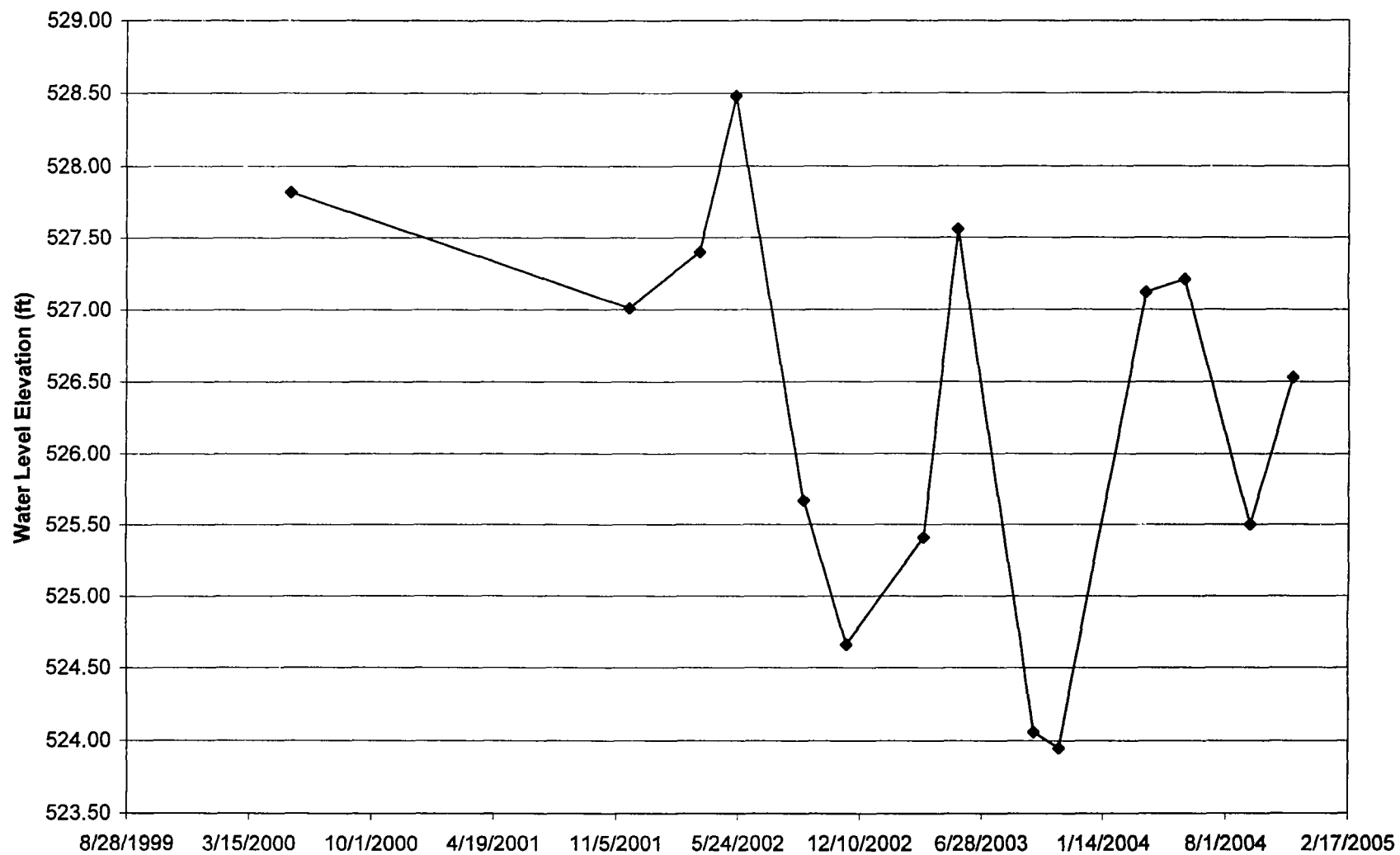
MW-66-89 (HSU2)



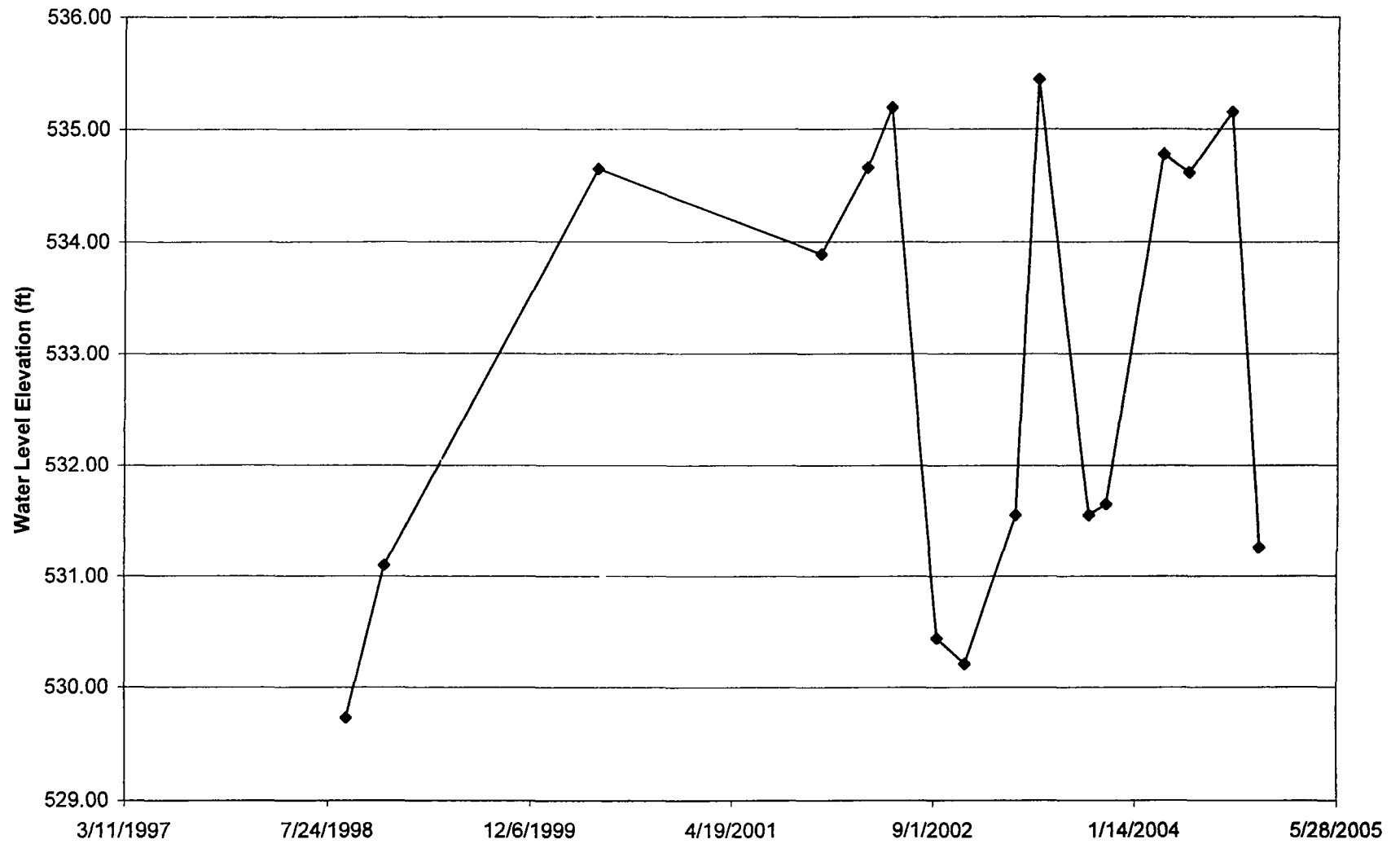
MW-69-90 (HSU2)



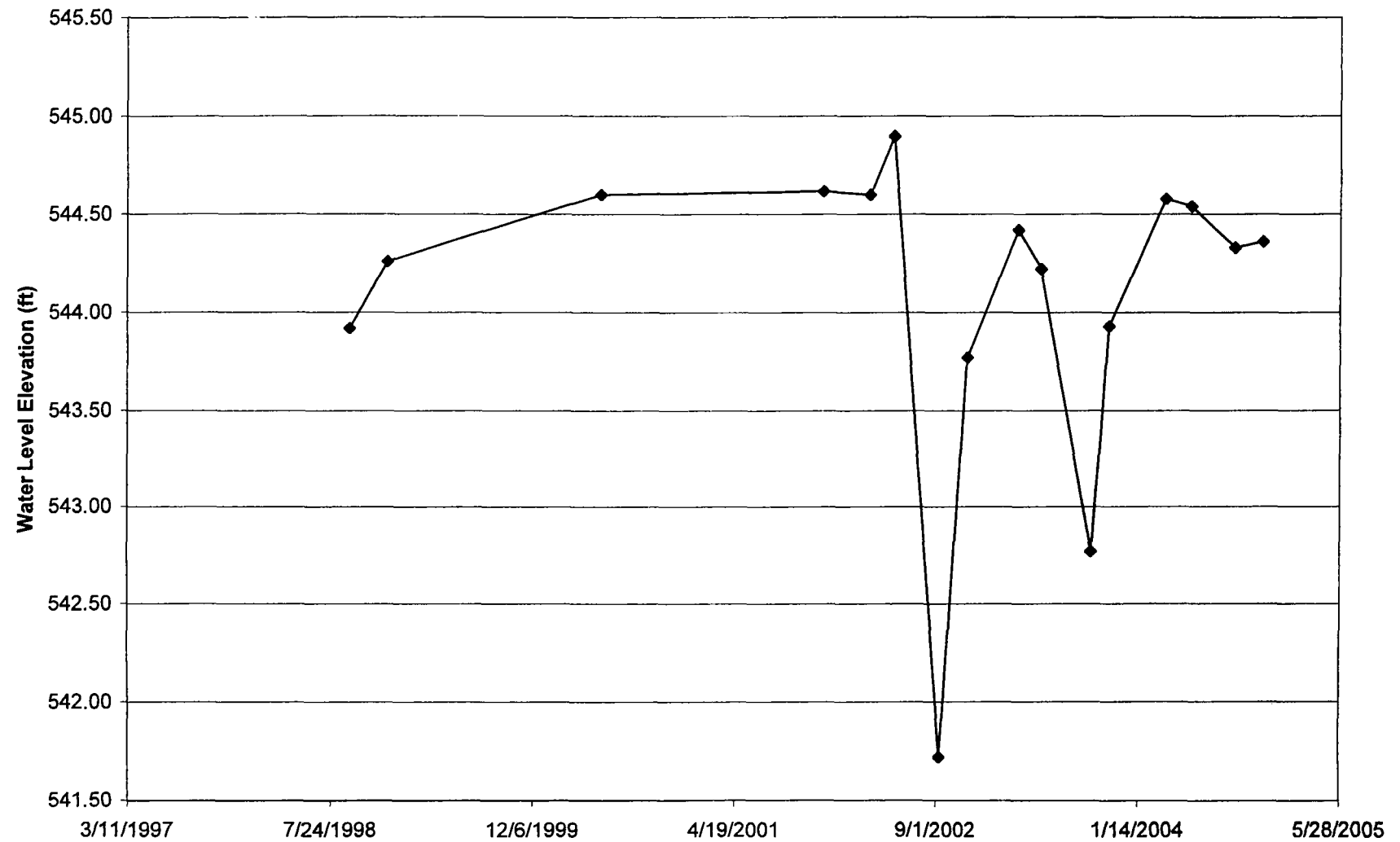
MW-86-98 (HSU2)



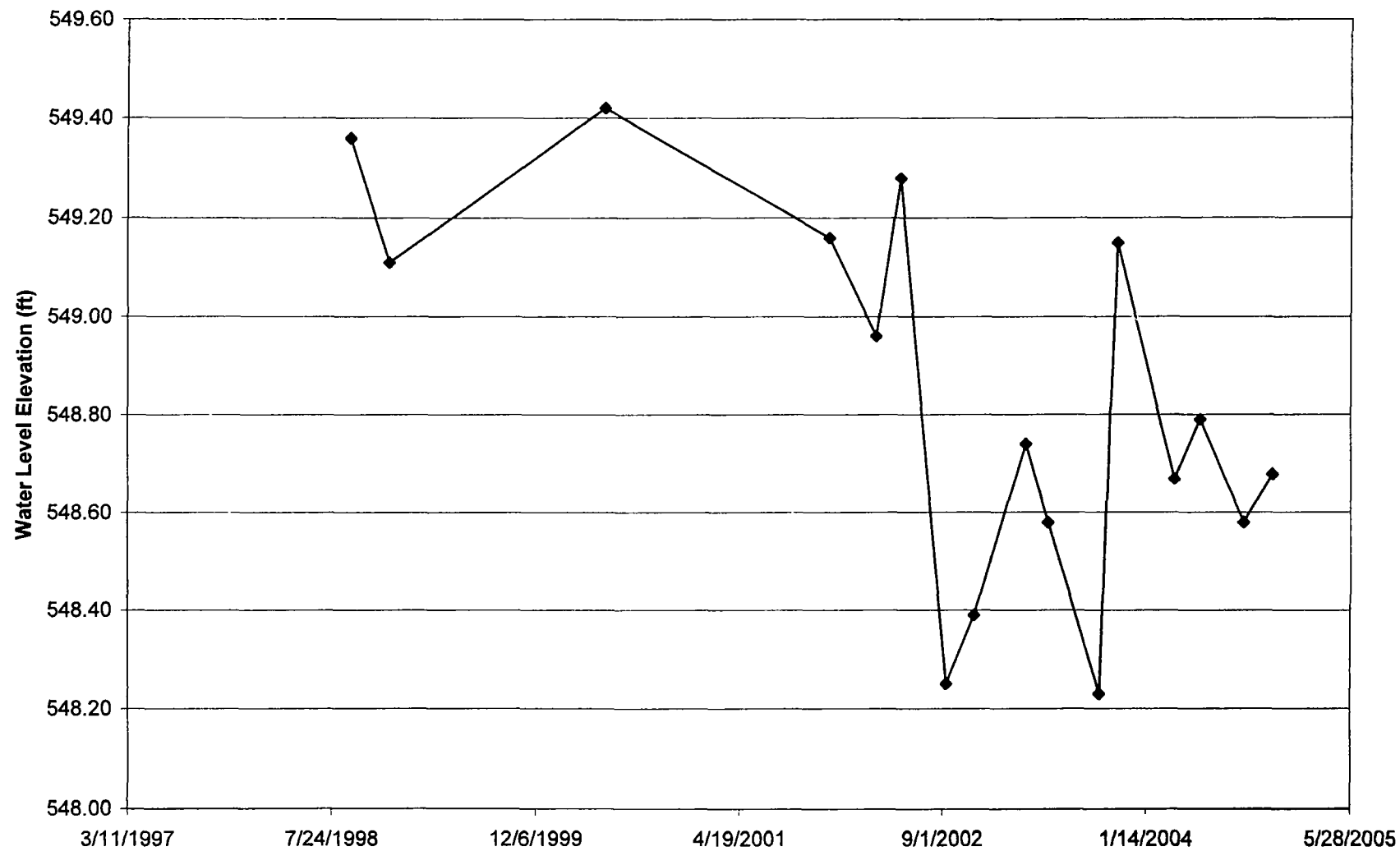
MW-88-98 (HSU2)



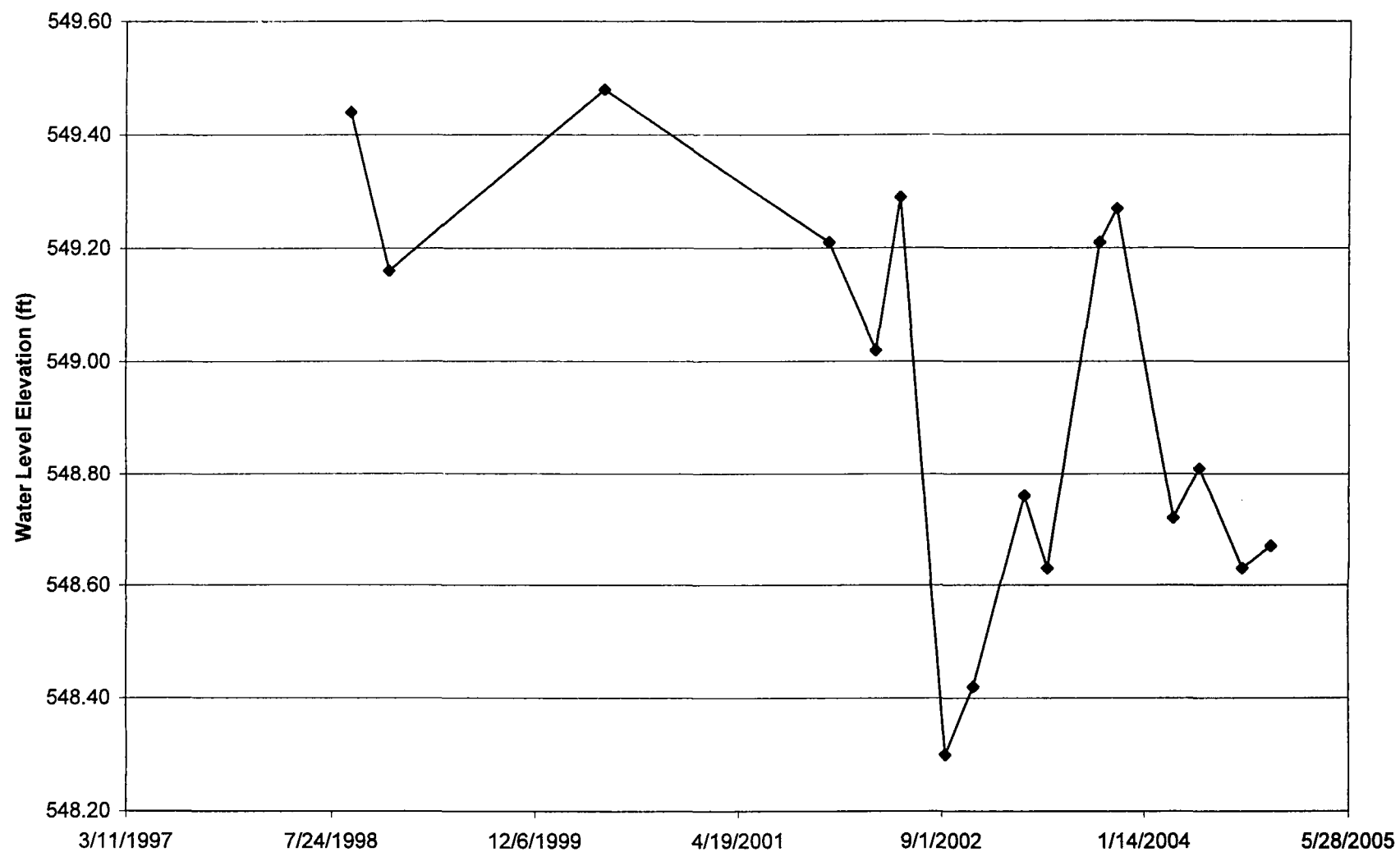
MW-92-98 (HSU2)



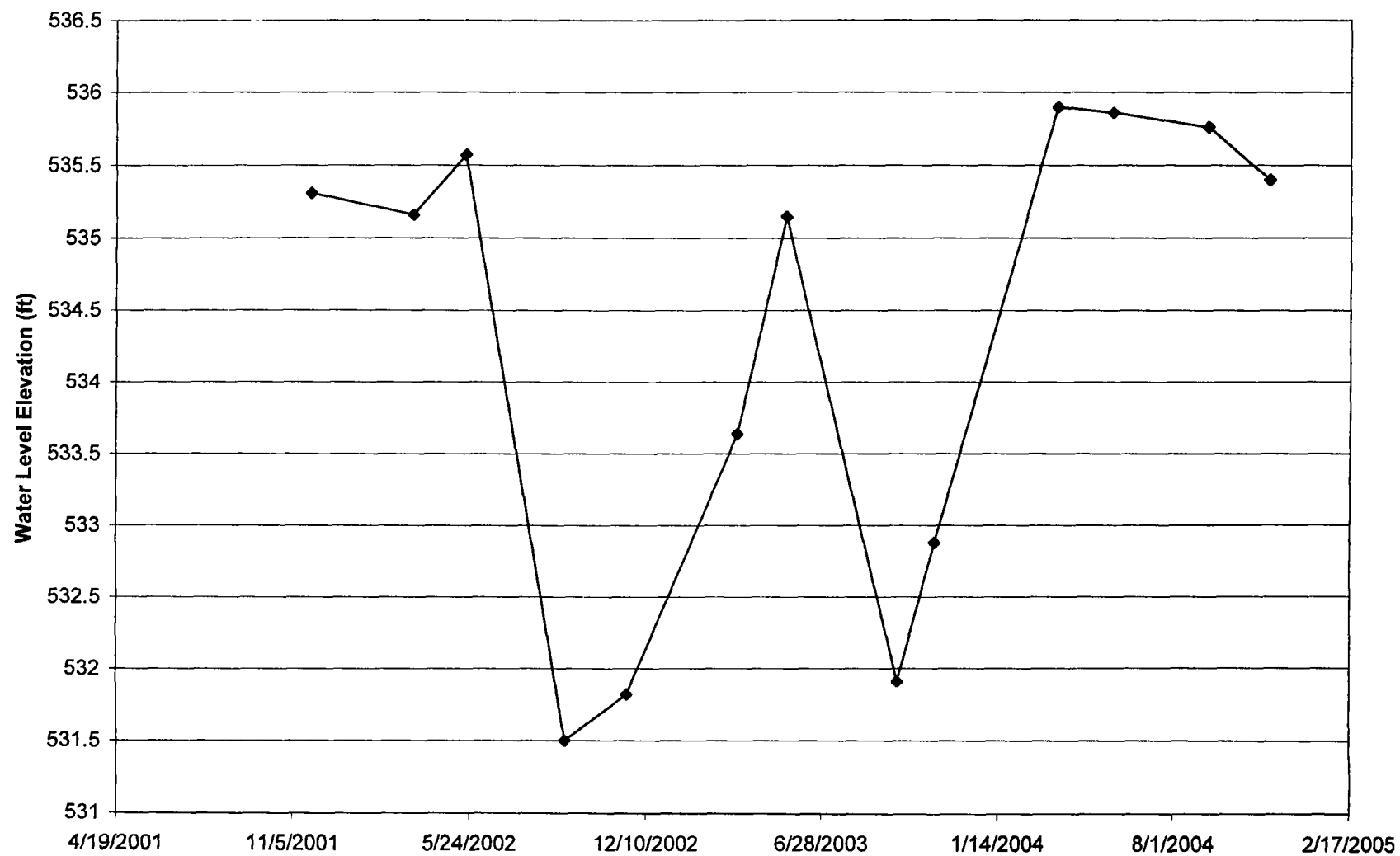
MW-94-98 (HSU2)



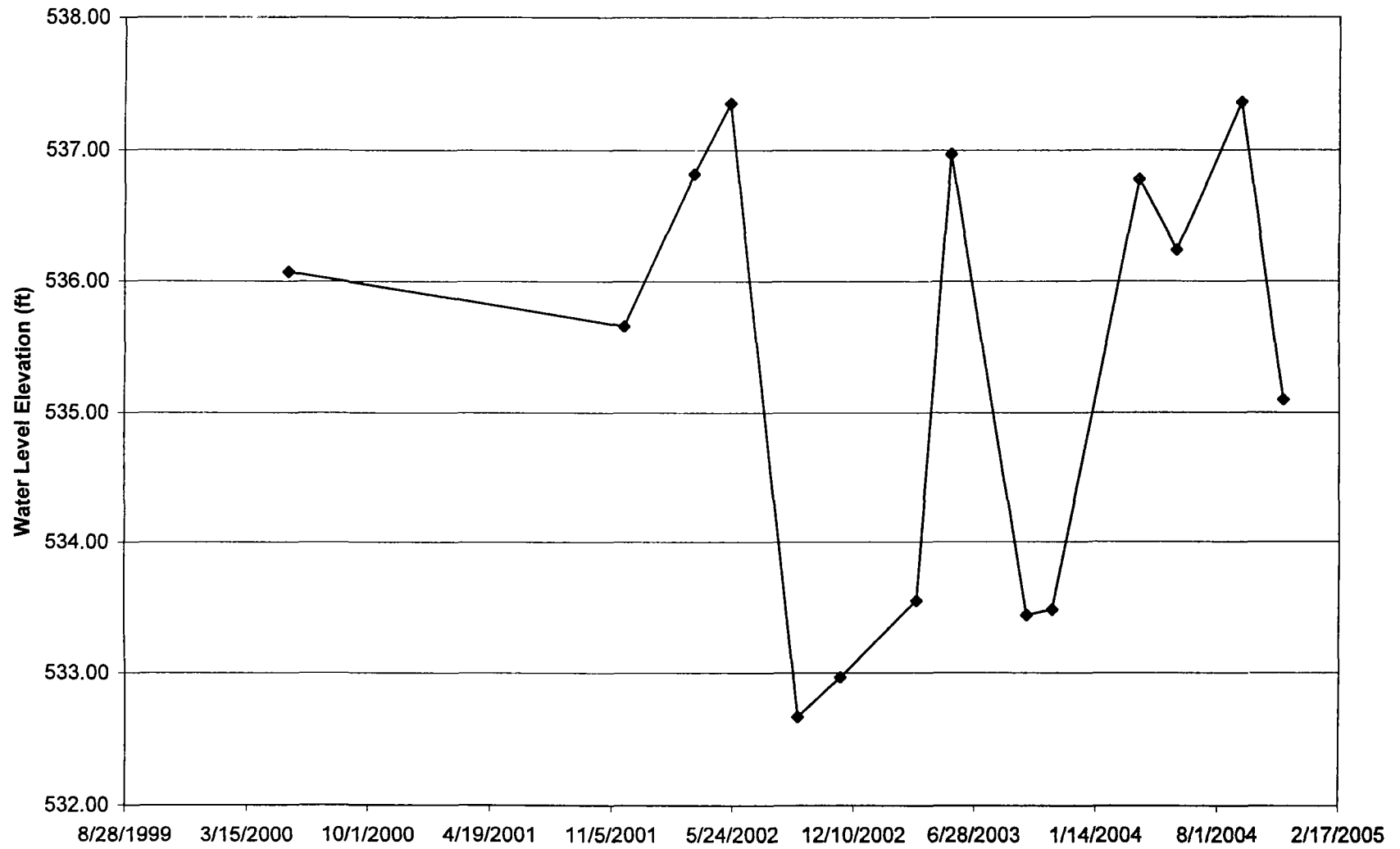
MW-95-98 (HSU2)



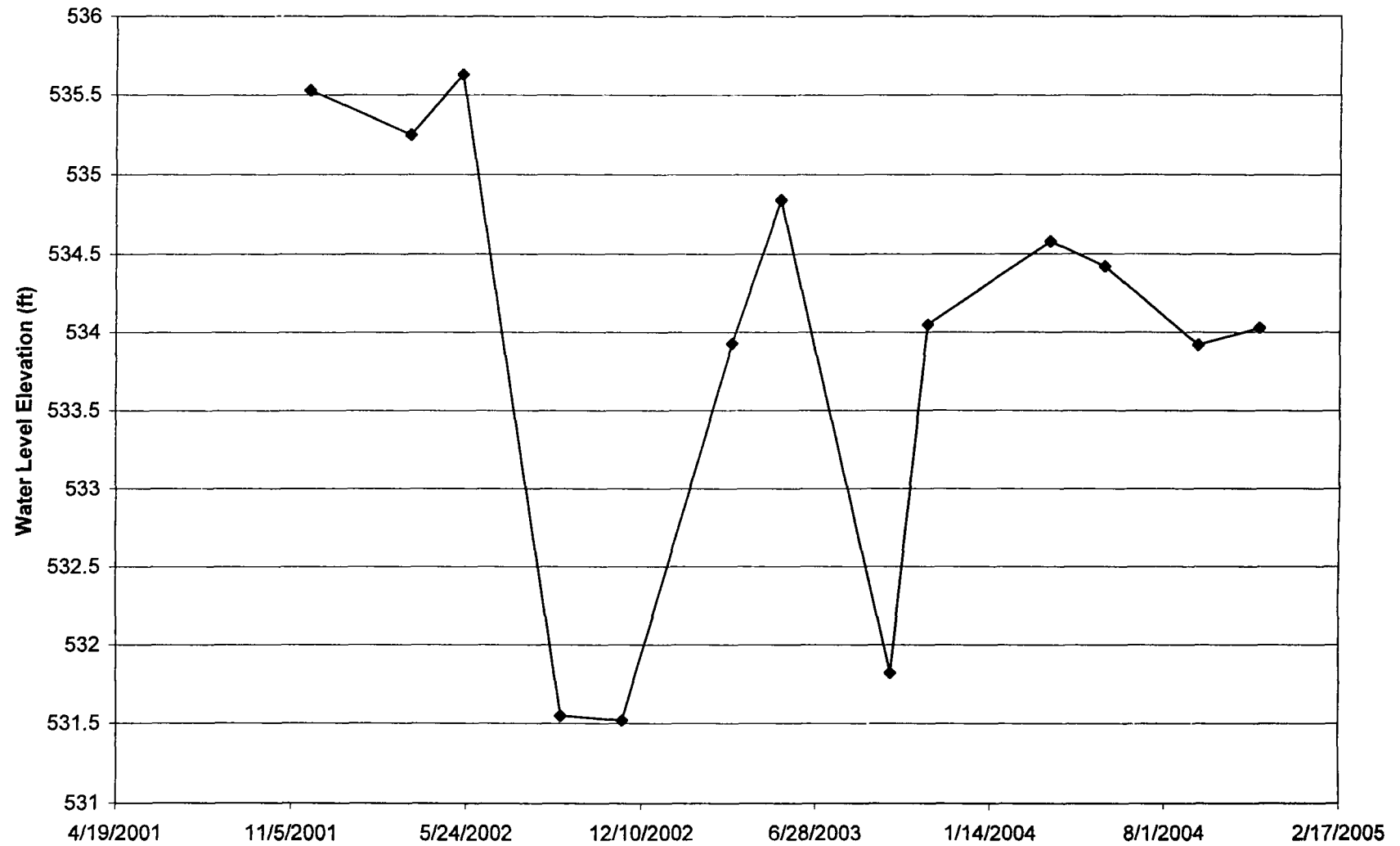
MW-97R-00 (HSU2)



MW-98-99 (HSU2)

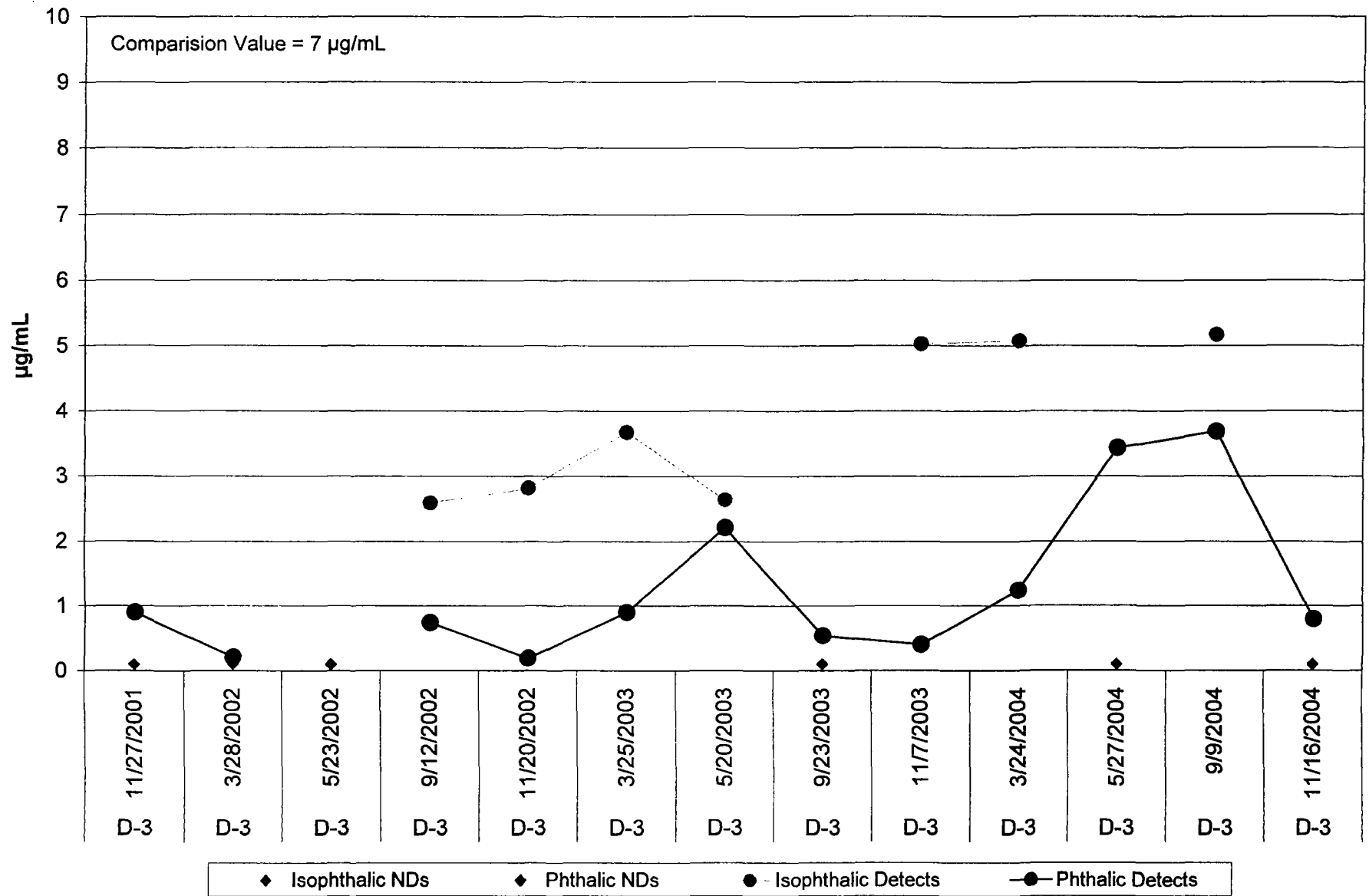


MW-99R-00 (HSU2)

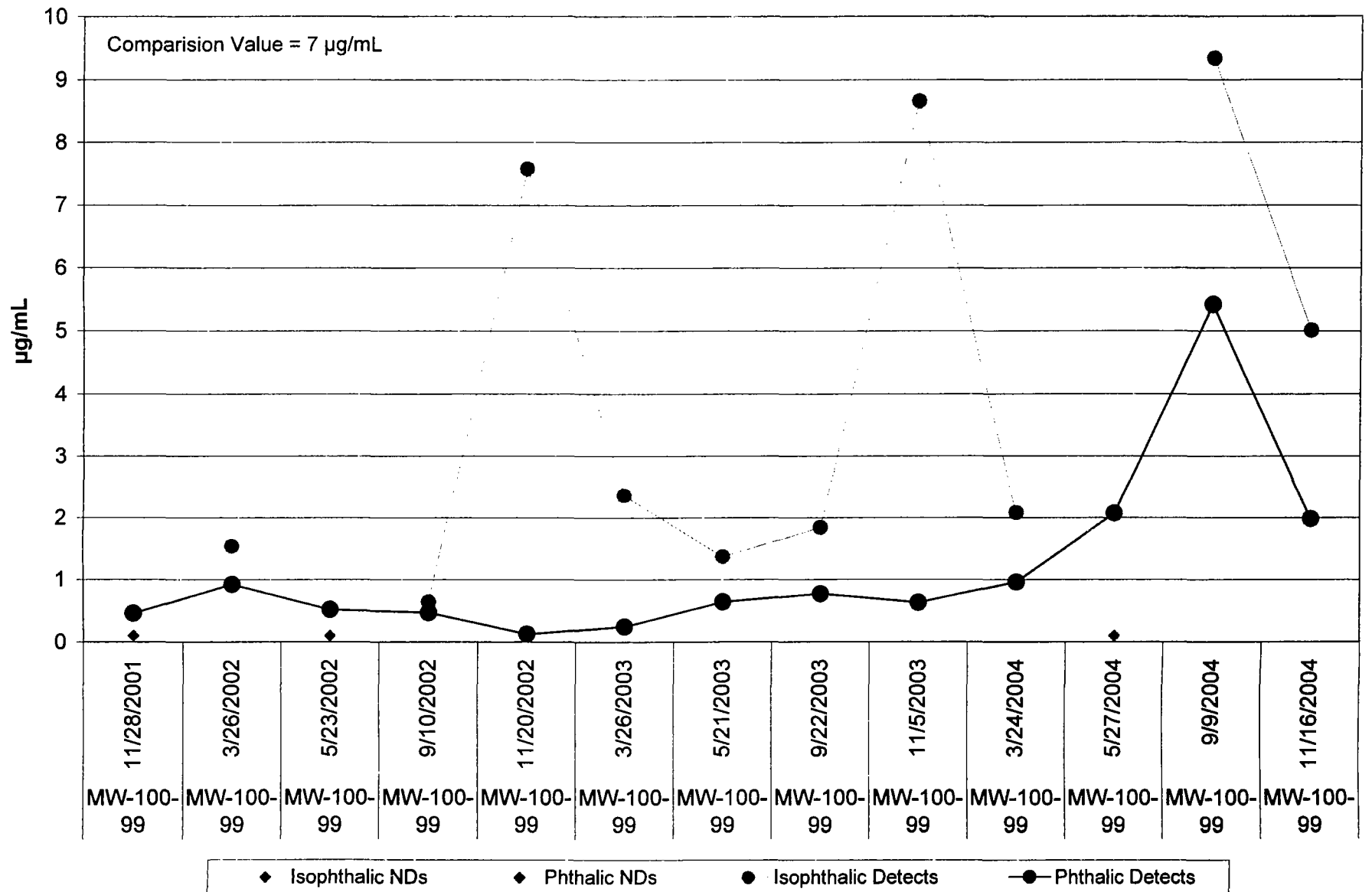


Appendix B - Chemical Concentrations Over Time

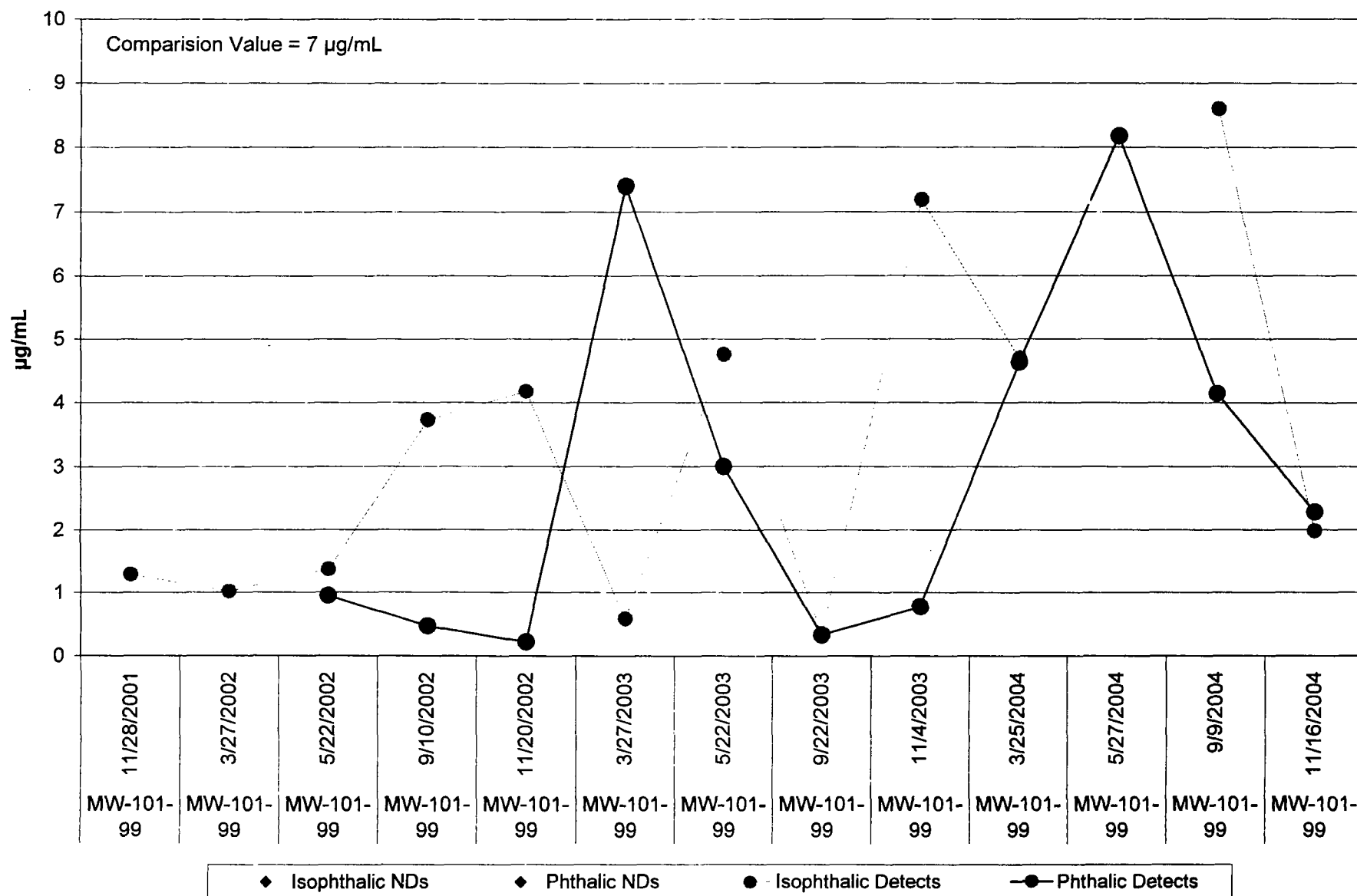
Amoco
Well D-3



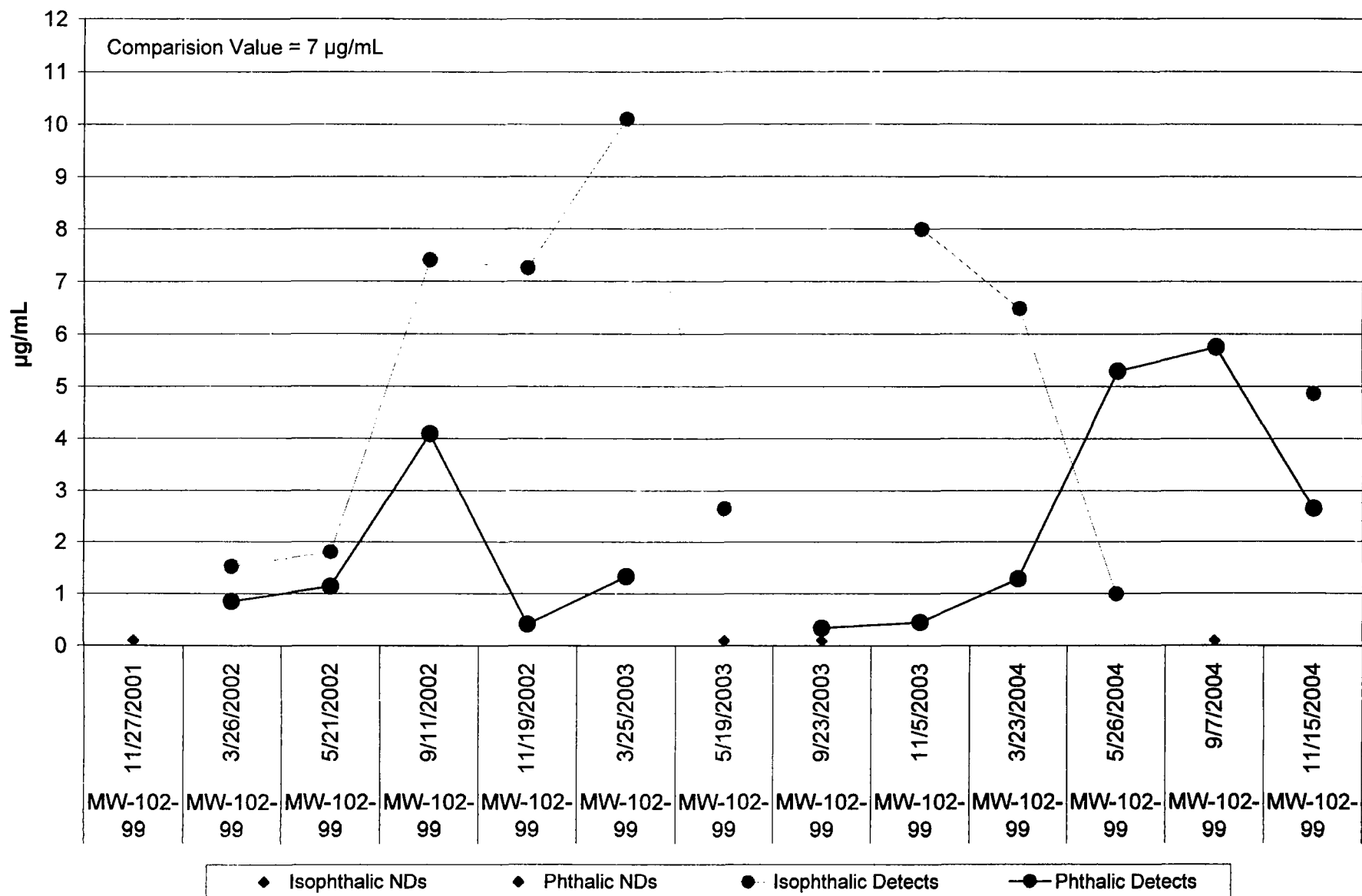
**Amoco
Well MW-100-99**



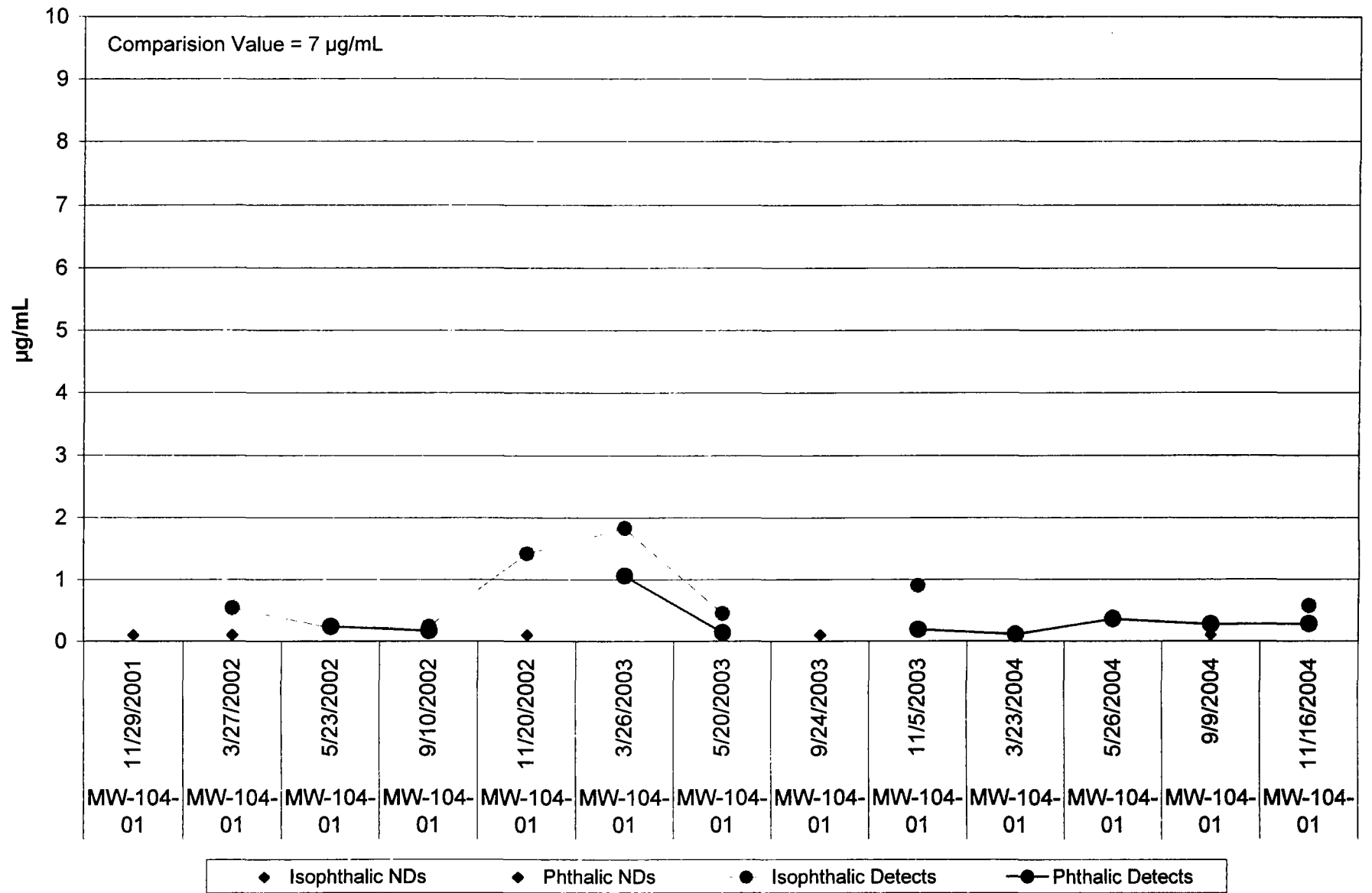
Amoco Well MW-101-99



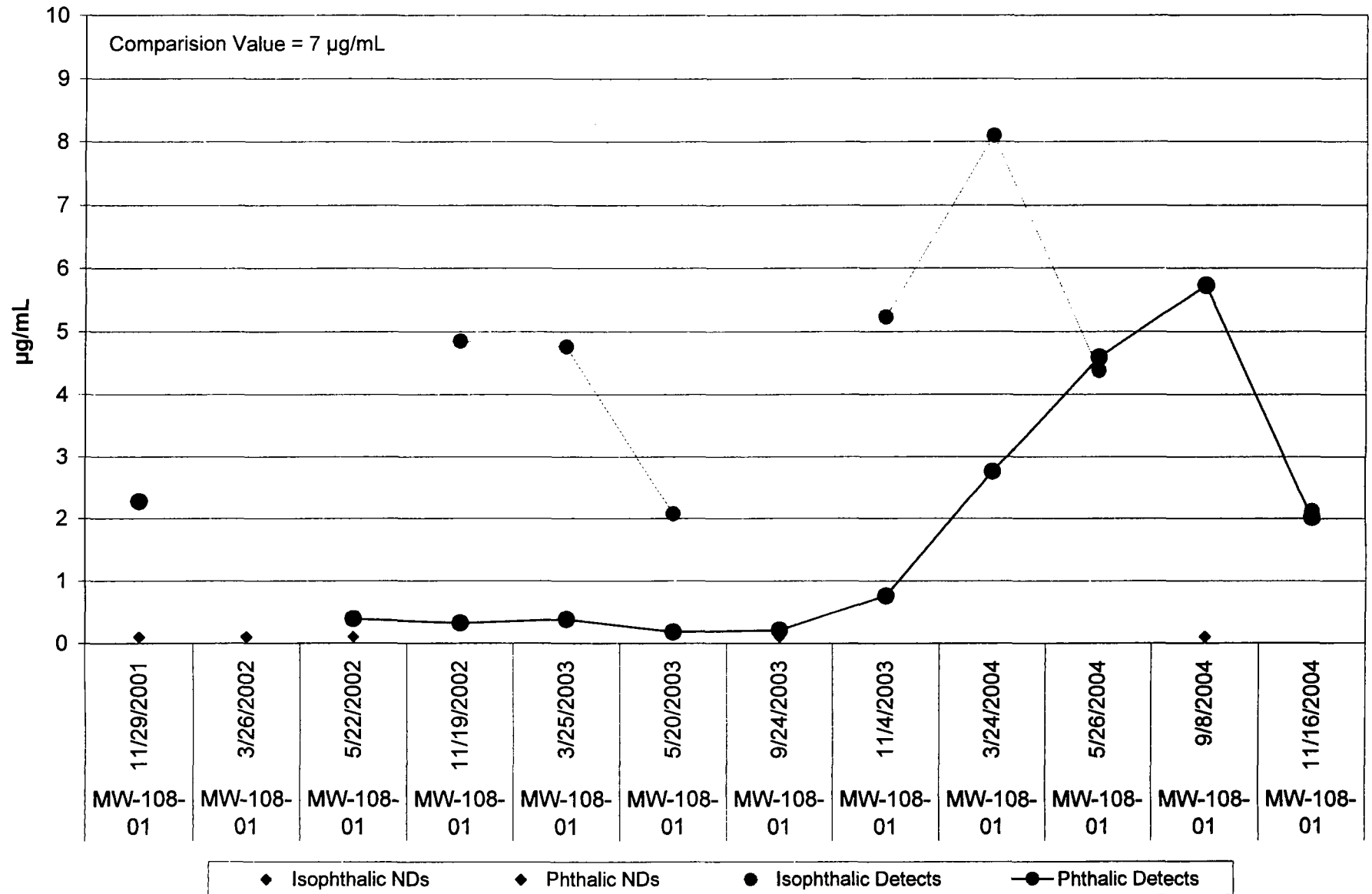
**Amoco
Well MW-102-99**



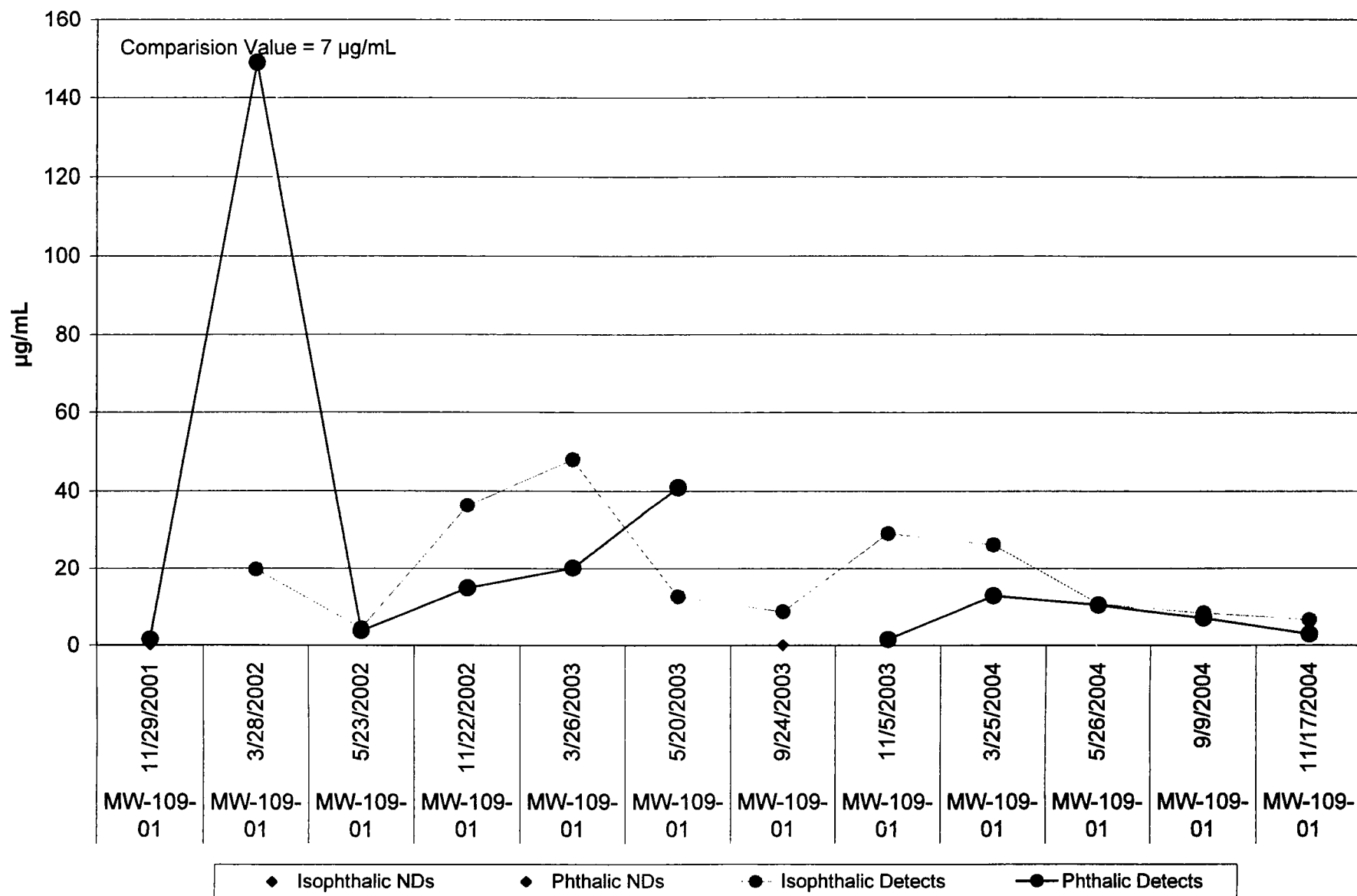
**Amoco
Well MW-104-01**



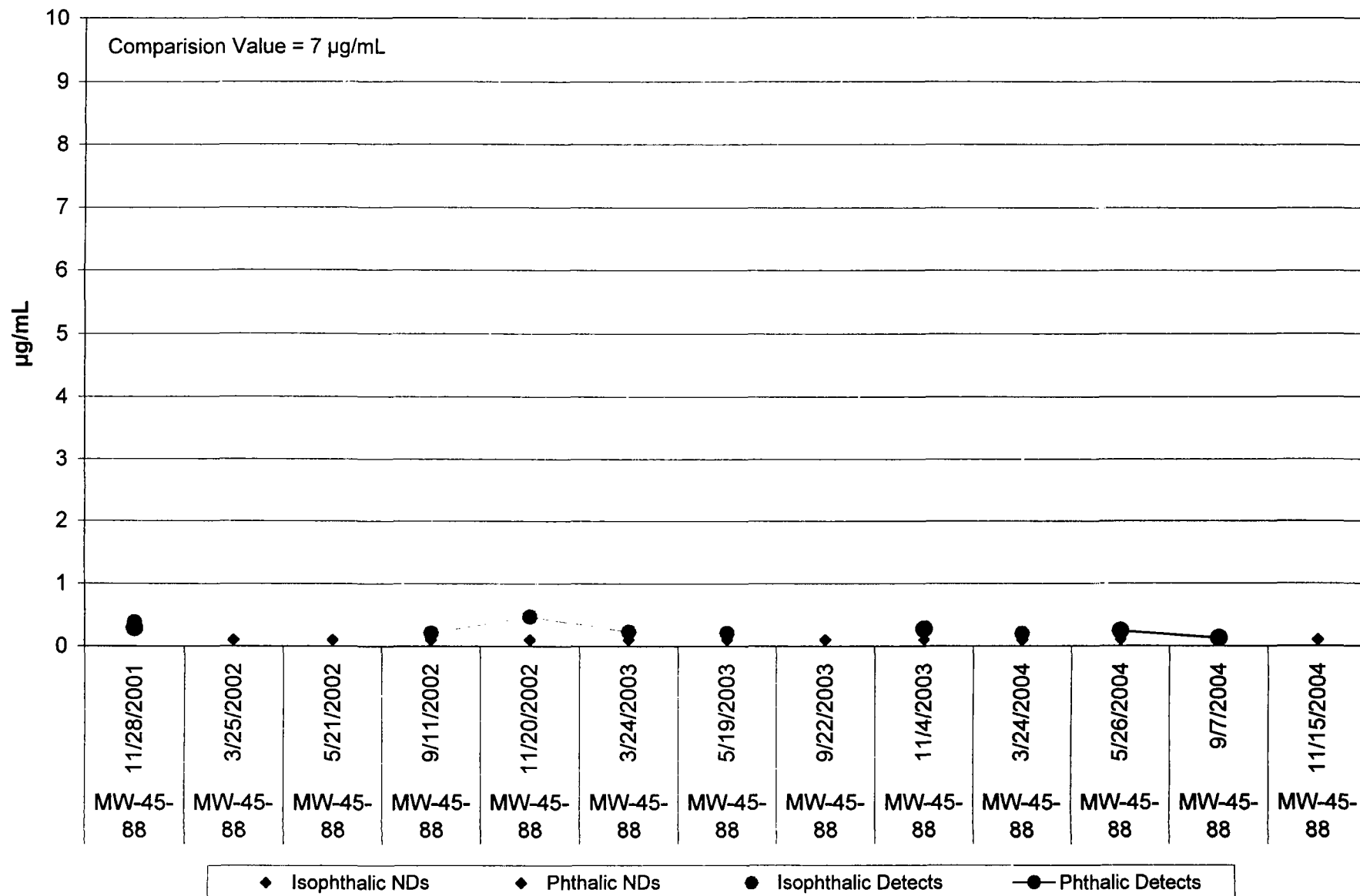
**Amoco
Well MW-108-01**



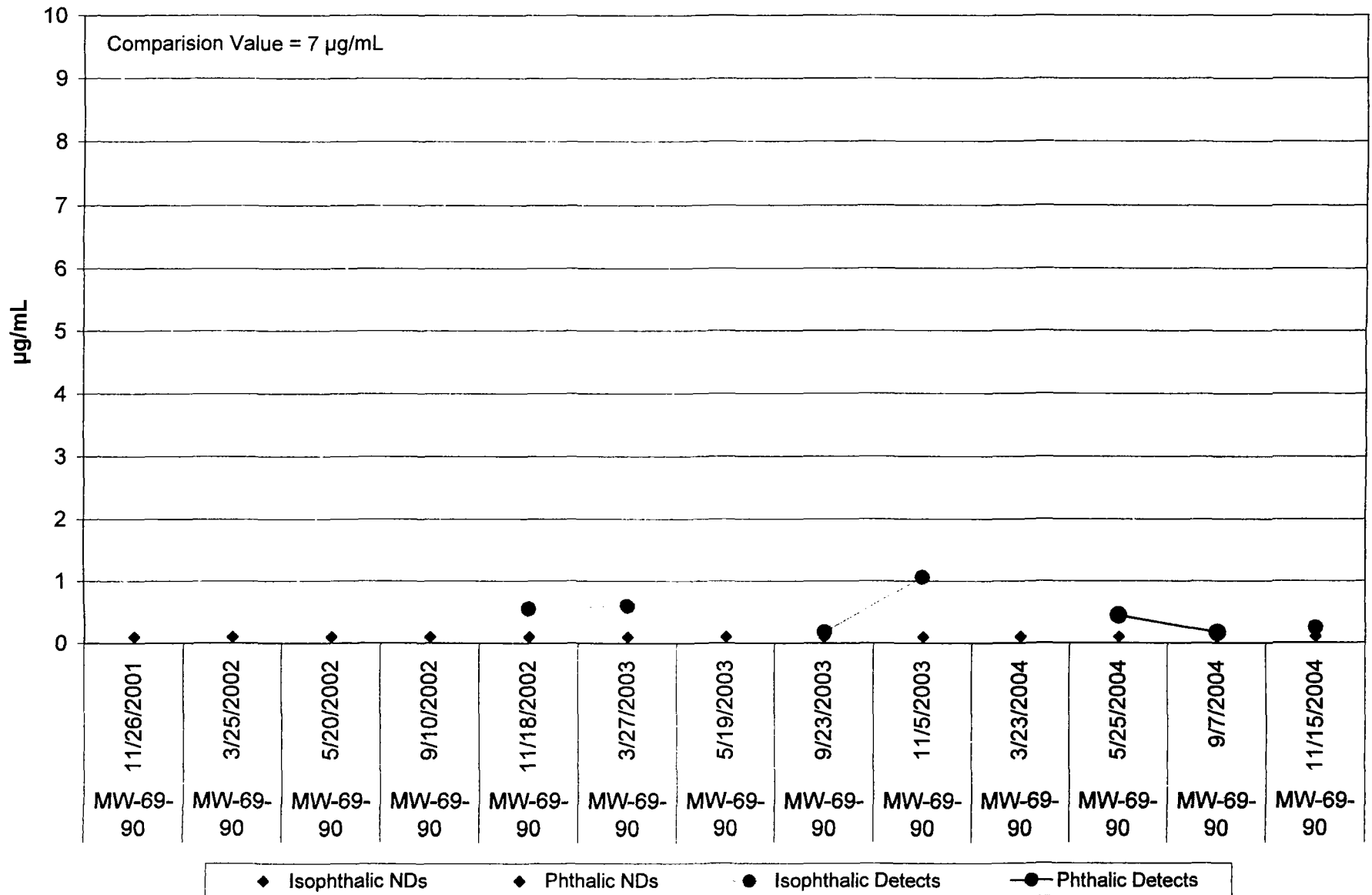
**Amoco
Well MW-109-01**



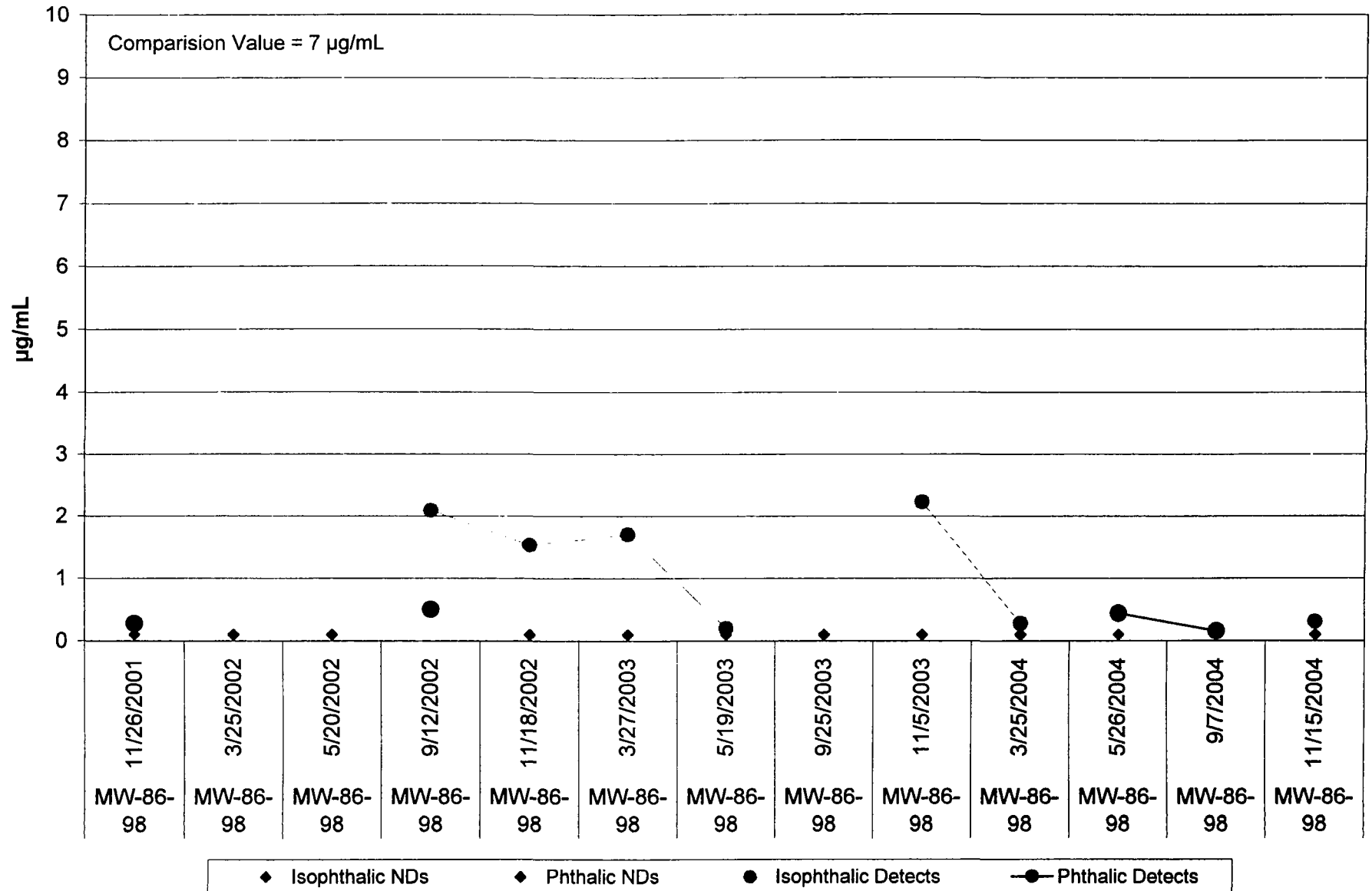
**Amoco
Well MW-45-88**



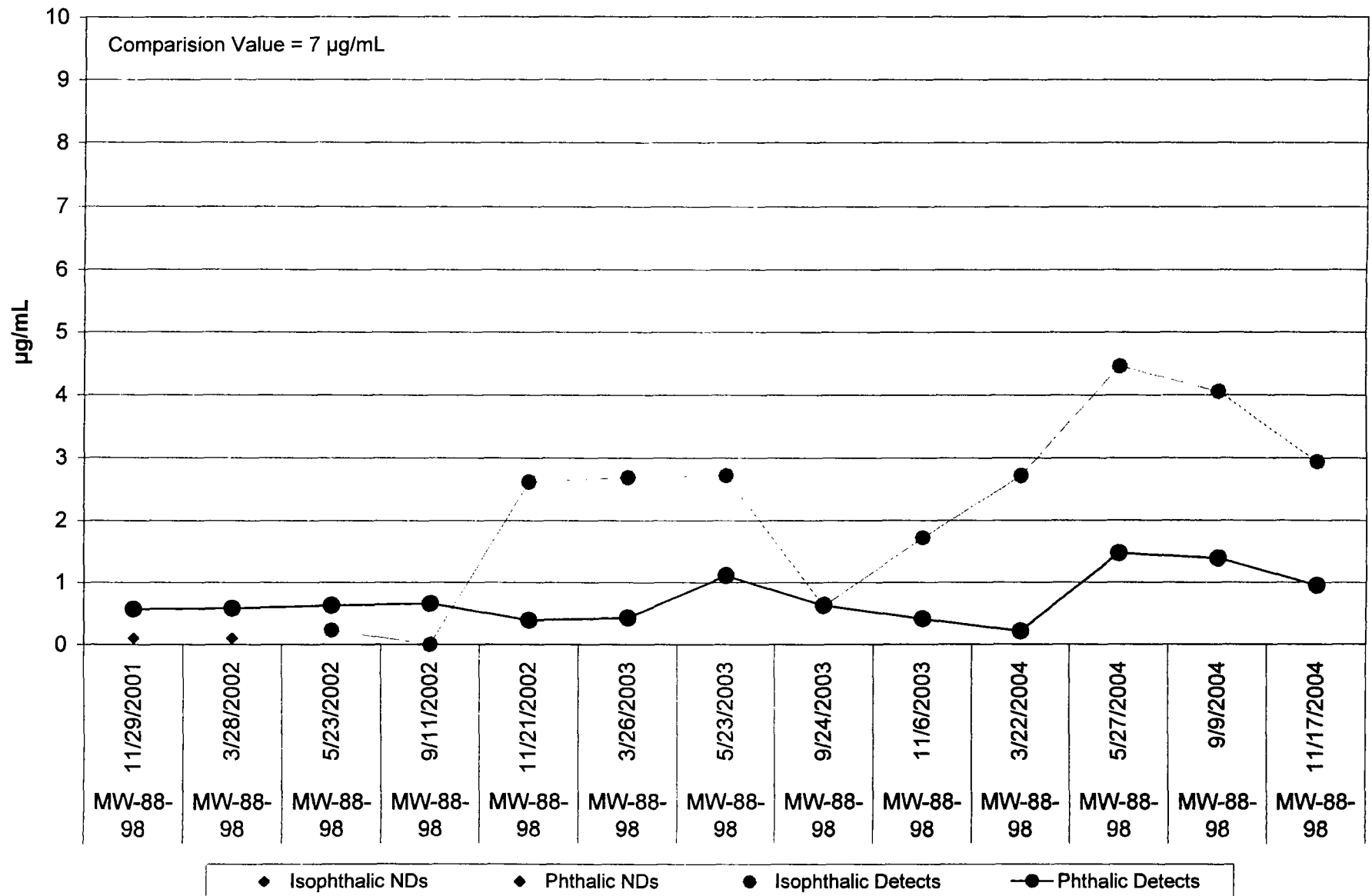
**Amoco
Well MW-69-90**



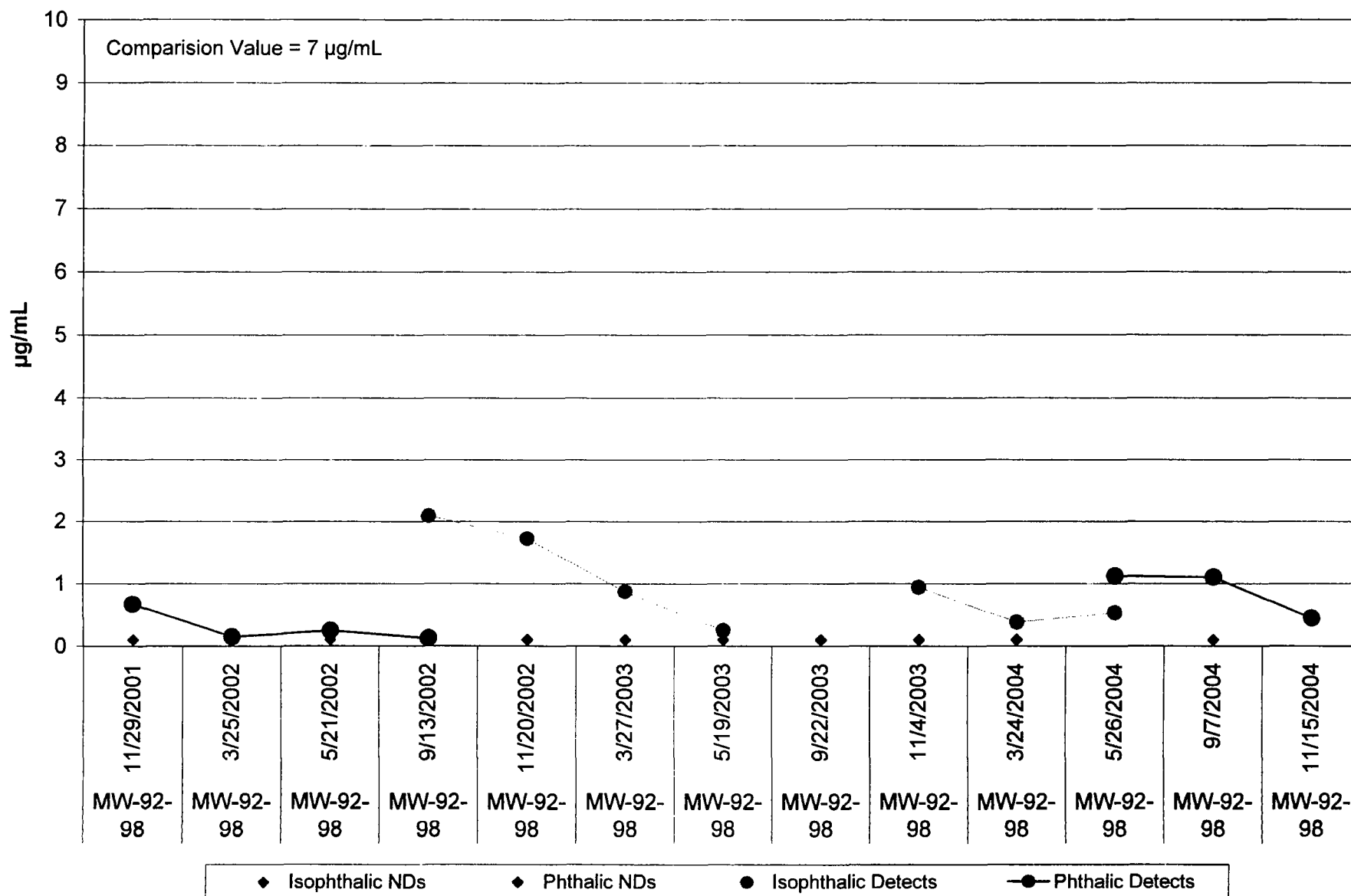
**Amoco
Well MW-86-98**



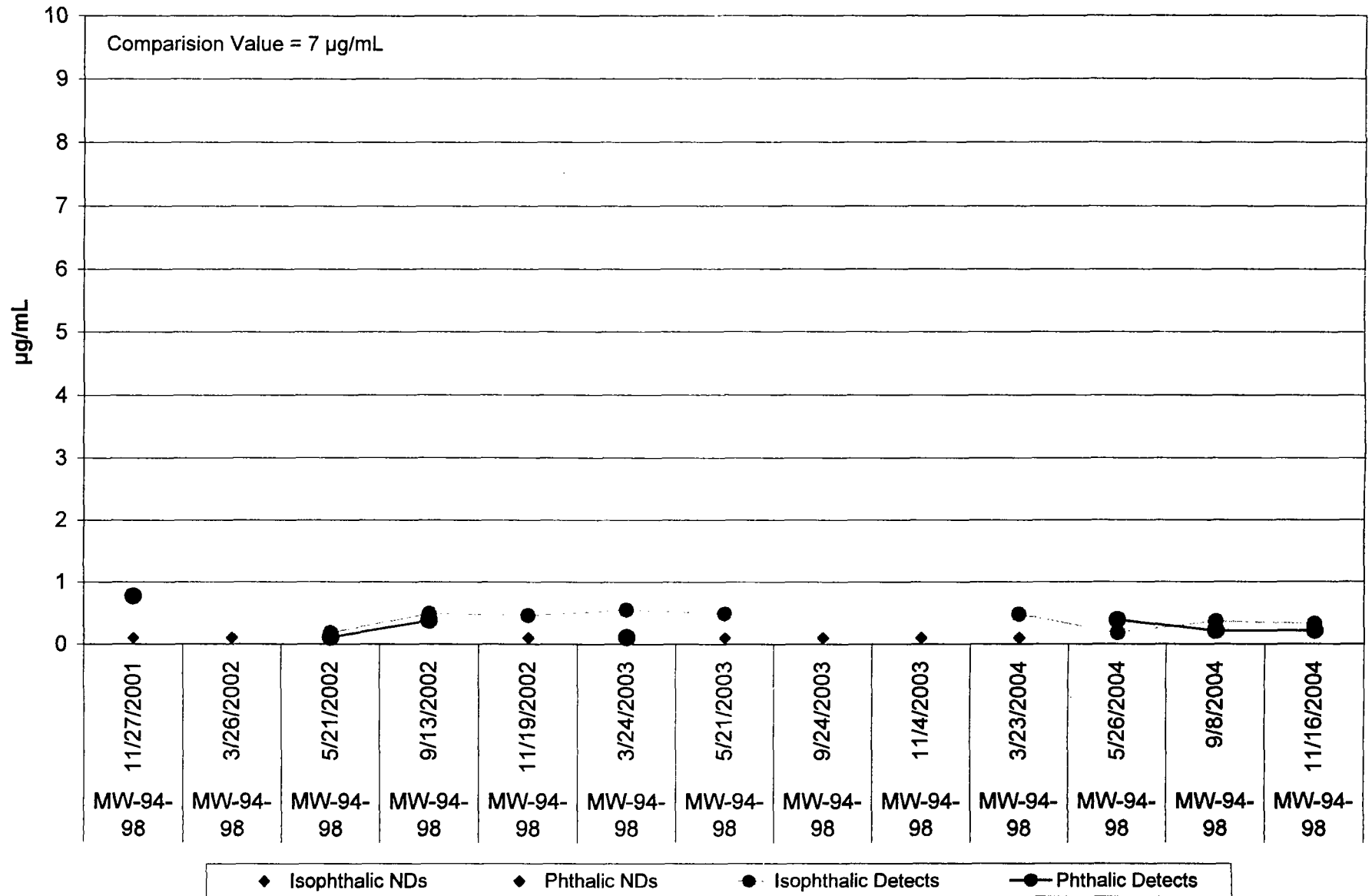
**Amoco
Well MW-88-98**



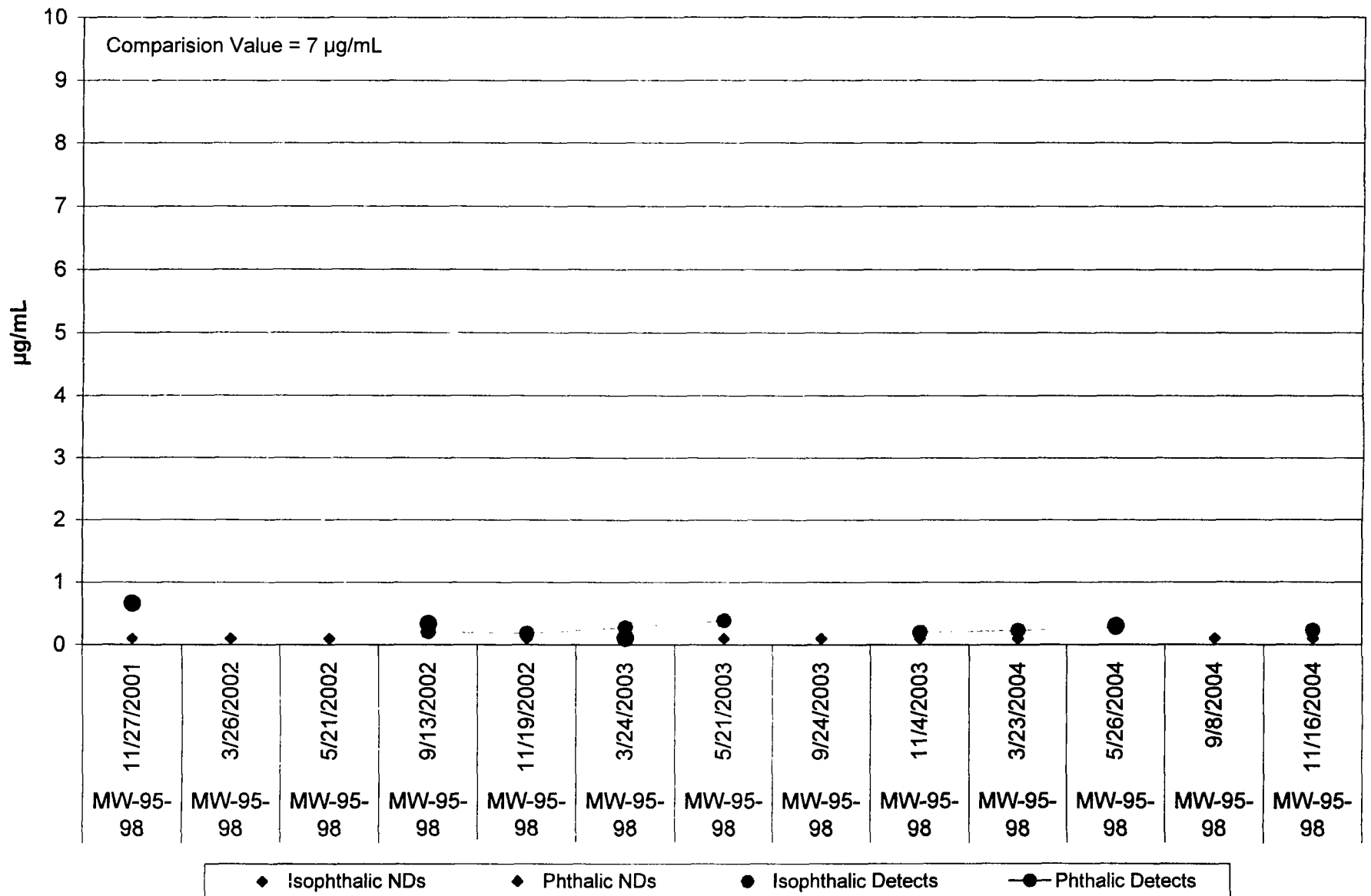
**Amoco
Well MW-92-89**



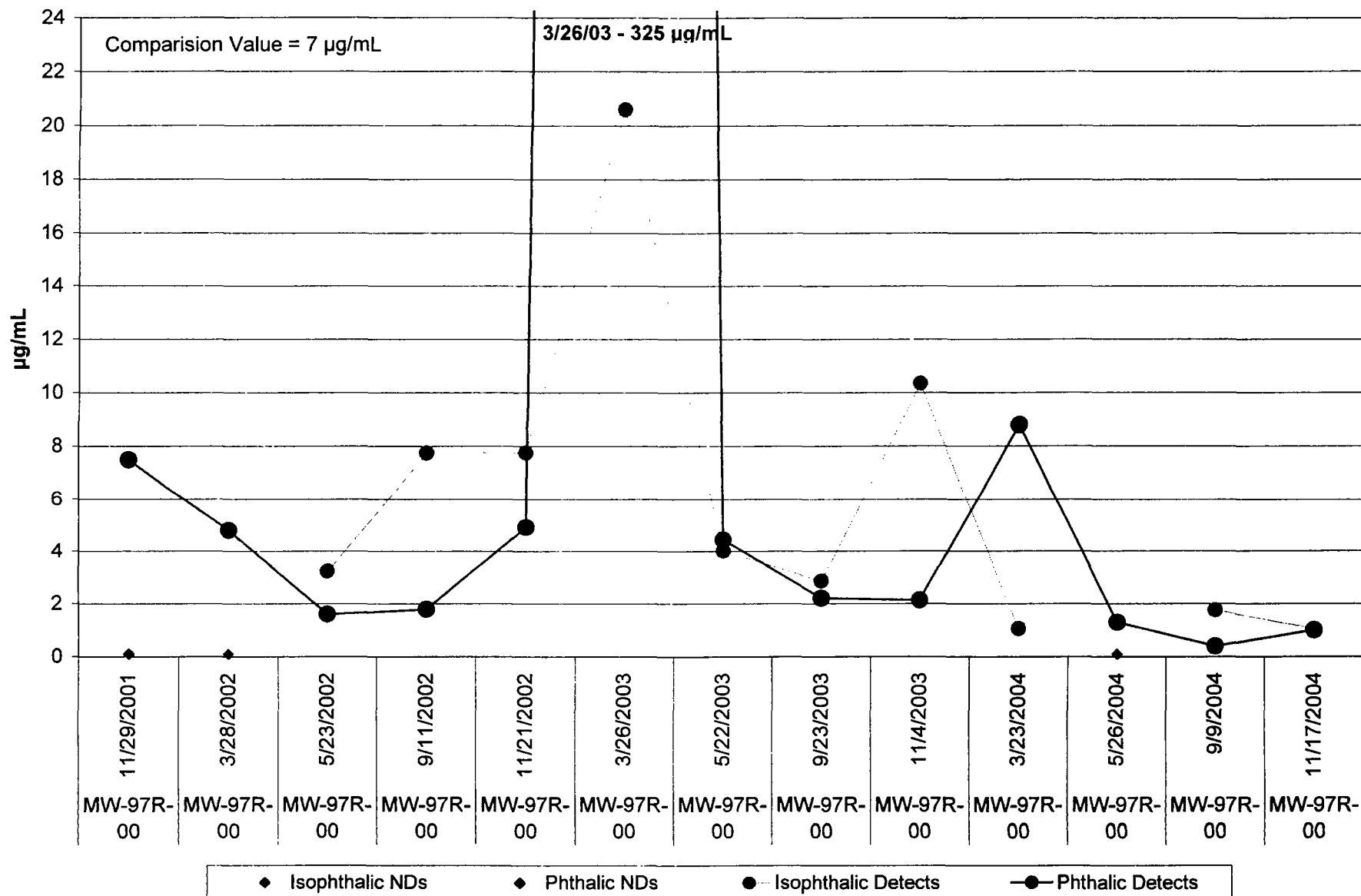
**Amoco
Well MW-94-98**



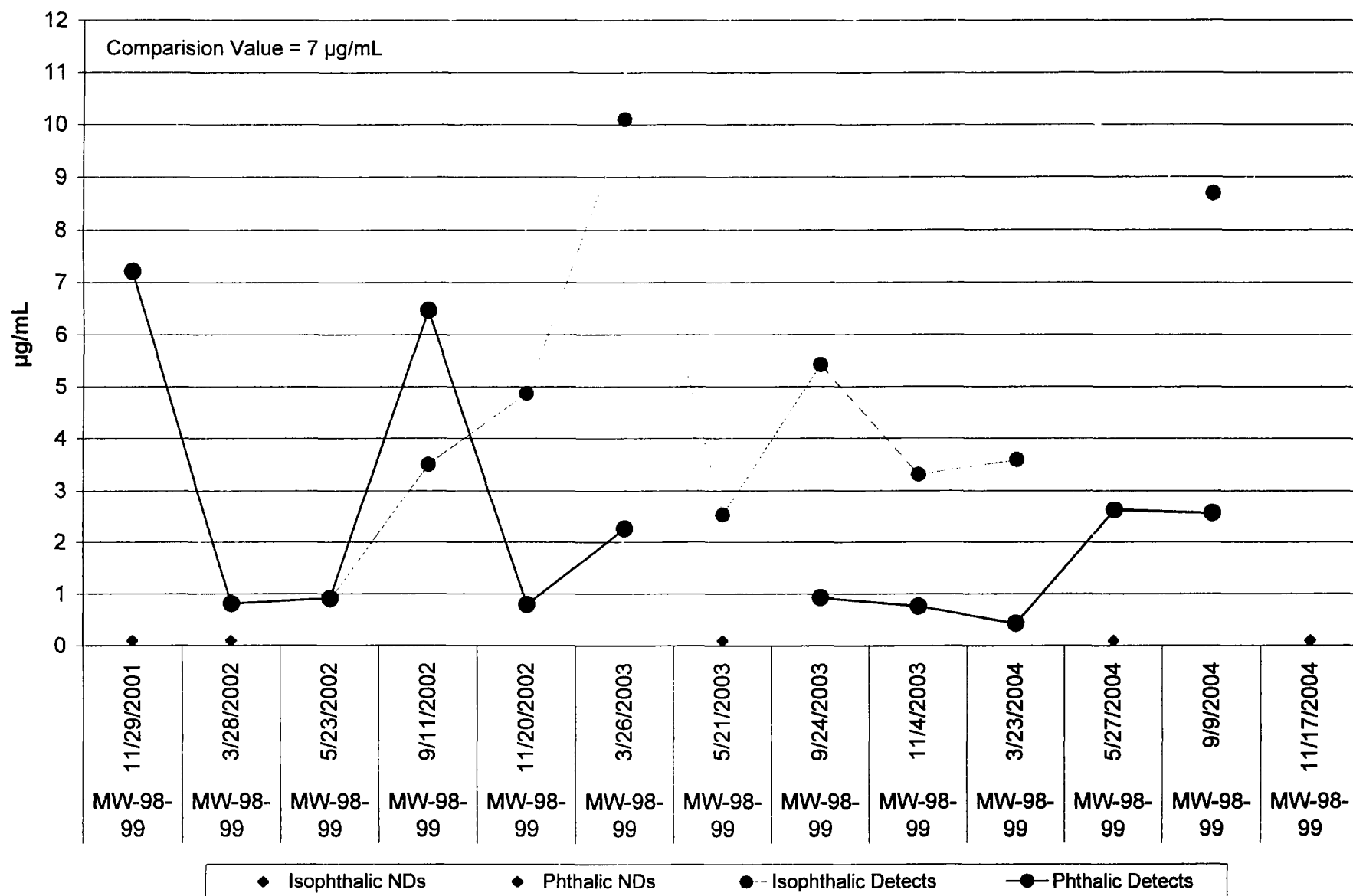
**Amoco
Well MW-95-98**



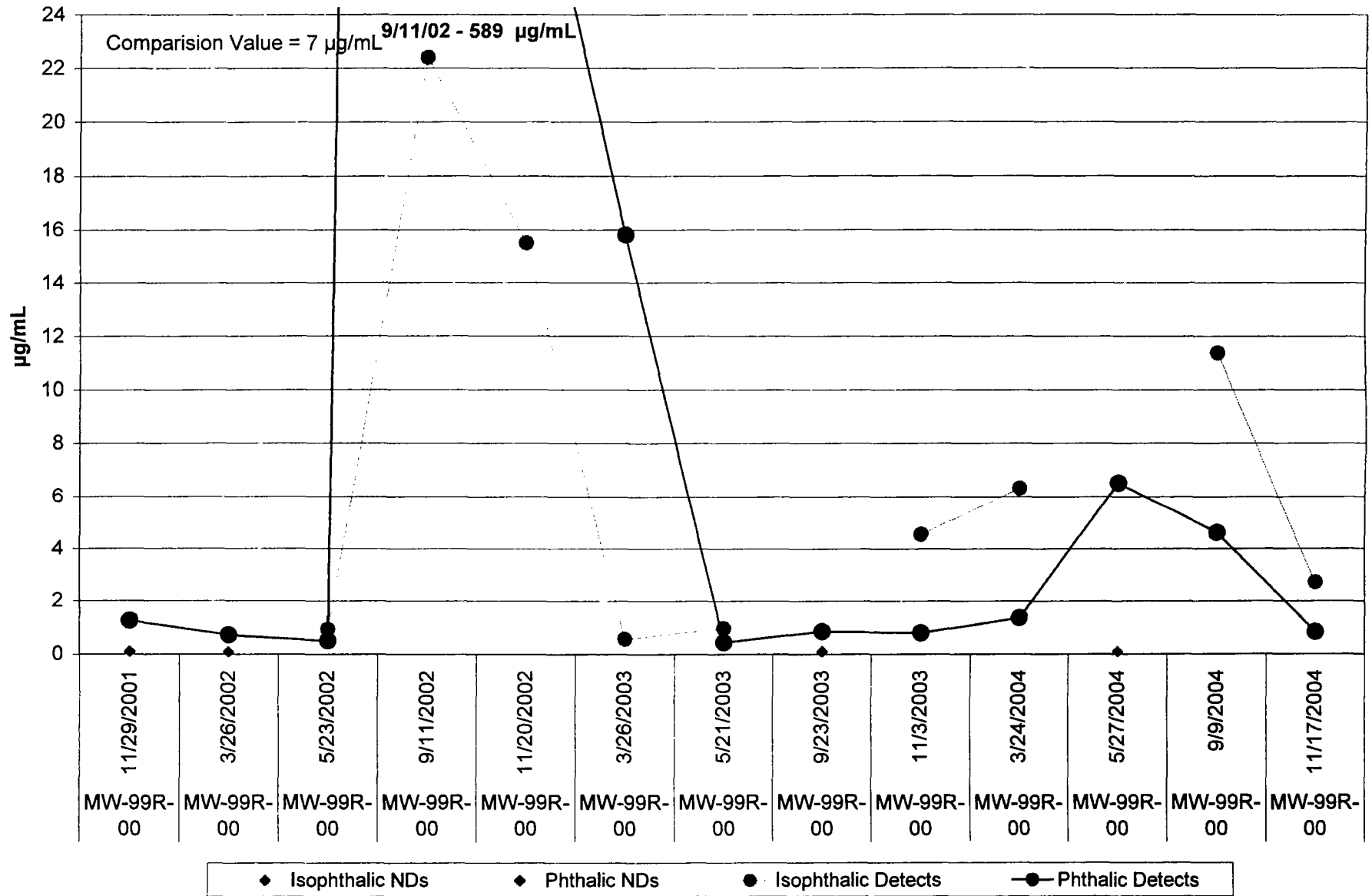
**Amoco
Well MW-97R-00**



**Amoco
Well MW-98-99**



**Amoco
Well MW-99R-00**



Appendix C – Comments Received from Support Agencies and/or the Community



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

September 26, 2005

VIA FACSIMILE
VIA ELECTRONIC MAIL

REPLY TO THE ATTENTION OF

SR-6J

Sandra Bron
Project Coordinator
Illinois Environmental Protection Agency
P.O. Box 19276
Springfield, Illinois 62794-9276

RE: Amoco Chemical (Joliet Landfill) Superfund Site; Joliet, IL.
Five Year Review Report; U.S. EPA Concurrence.

Dear Sandra:

On September 20, 2005, the United States Environmental Protection Agency (U.S. EPA) received from the Illinois Environmental Protection Agency (IEPA) final revisions to the above referenced document via electronic mail. This letter serves as official concurrence from U.S. EPA Region 5 (the Support Agency) with that final version of the Five Year Review Report (the "Report").

A copy of this letter should be included in the Report as Appendix C ("Comments Received from Support Agencies and/or the Community"). As confirmed with you previously, neither U.S. EPA nor IEPA received any comments or information requests as a result of the Public Notice Advertisement.

In order to save time, I am requesting that you please provide two (2) signature sheets to your management for approval of the Report. One original signature page should be retained by IEPA and the other sent to U.S. EPA. In order for both Agencies to each have original signatures on the Report, I will do the same.

If you have any questions, please contact me at (312) 886-0800 or by electronic mail at Fagiolo.John@epa.gov. For legal matters you may contact Ms. Sherry Estes at (312) 886-7164 or by electronic mail at Estes.Sherry@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "John V. Fagiolo".

John V. Fagiolo
Remedial Project Manager
Superfund Division
U.S. EPA, Region 5